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14538

OPERATOR'S HANDBOOK

for

TELETYPEWRITER SETS AN/FGC-38, AN/FGC-38X, AND AN/FGC-39

11-14583

THIS HANDBOOK IS A REPRODUCTION OF SECTIONS 4 AND 5 OF THE COMPLETE INSTRUCTION BOOK NAVSHIPS 92378

TELETYPE CORPORATION
CHICAGO, ILLINOIS

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Code 993-100
12 October 1954

From: Chief, Bureau of Ships
To: All Activities Concerned with the Installation, Operation and Maintenance of the Subject Equipment

Subj: Instruction Book for Teletypewriter Sets AN/FGC-38, AN/FGC-38x and AN/FGC-39, NAVSHIPS 92378

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Chief of Bureau

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SECTION 4
OPERATION

1. INTRODUCTION.

a. GENERAL.—Teletypewriter Set AN/FGC-38, AN/FGC-38X, or AN/FGC-39 is a semiautomatic tape relay equipment and performs three basic functions. The first function of the equipment is to receive automatic telegraph signals from distant points and record these signals on a chadless perforated tape with the message typed over the perforations. The second function of the equipment is to produce automatic telegraph signals from perforated tape and to transmit these signals to distant points. The third function of the equipment is to automatically monitor all transmitted messages and numbers for storage.

b. RECEIVER GROUP OA-616/FGC-38, OA-619/FGC-38X, OR OA-622/FGC-39.—The receiver group is composed, basically, of three reperforators, each of which is associated with a separate incoming signal line. (See figure 4-1.) A fourth reperforator is also included which is used as a spare. An incoming message, in the form of automatic telegraph signals, is applied to a reperforator. The reperforator records the message on a tape in two ways; first, by perforating, and second, by typing the message on the tape. The received message is then fed out of the reperforator through a slot in the front of the receiver cabinet. The entire receiving operation is fully automatic.

Two visual indicators are provided to enable an operator to determine that the supply of tape for a reperforator is nearly exhausted. The first visual indicator is the TAPE OUT lamp that lights when a roll of tape is nearly exhausted, and the second is the tape itself which is red as it approaches the end of the roll. Four TAPE OUT lamps (two front and two rear) are provided, two (one front and one rear) for each half of the receiver cabinet. The controls on the rear panel are in parallel with those on the front panel. The TAPE OUT lamp, located on the left side of the front panel, lights when either reperforator in the left half of the receiving cabinet is running out of tape. The TAPE OUT lamp, located on the right side of the front panel, lights when any reperforator in the right half of the receiving cabinet is running out of tape. The specific reperforator that is running out of tape, of the three possible indicated by the TAPE OUT lamp, is identified by the red tape coming out of that reperforator. When the exhausting roll has been identified, a new roll of tape must be inserted after the end of a message.

Since replacing the roll of tape in a particular operating reperforator may result in the loss of messages, a spare reperforator is provided in each receiver group. The spare reperforator in this instance becomes the operating reperforator while the new roll of tape is being placed on the reel in the tape container. The spare reperforator is placed in the circuit in order that any incoming message may be recorded with no interruption in the service. To accomplish this, a jack panel on the front and rear of the receiver cabinet and a patch cord are provided. Removal of the patch cord from the jack panel on the front or rear of the cabinet removes the spare reperforator from the line.

In the event that an incoming message is interrupted, due to a line failure, an OPEN LINE alarm lamp lights to warn the operator of the interrupted condition. One OPEN LINE alarm lamp is provided for each reperforator. The OPEN LINE alarm lamp remains lighted even after service is restored and is extinguished only by depressing the RESET button associated with the lighted lamp. The RESET buttons must also be depressed by the operator each time the equipment is turned on after shut-down. An OPEN LINE alarm lamp is also provided for the spare reperforator and must be extinguished by depressing that RESET button after the patching cord has been removed from the jack panel.

All the controls and jacks mentioned above are duplicated at the rear of the receiver group. The sliding trays are assembled to be pulled out from the rear of the cabinet, but they may be changed to be pulled out from the front instead of from the rear. There is space for six operating positions in each receiver group; four reperforators are supplied, thus leaving provision for two more reperforators in the cabinet when additional shelves are added. A transmitter circuit jack and a power receptacle located on the front of the cabinet are used for long message operation (optional) and are described in the following paragraph.

c. TRANSMITTER GROUP OA-615/FGC-38, OA-618/FGC-38X, OR OA-621/FGC-39.—The transmitter group is composed basically of six message distributor-transmitters and two bases, and three numbering distributor-transmitters and a base. (See figure 4-2.)

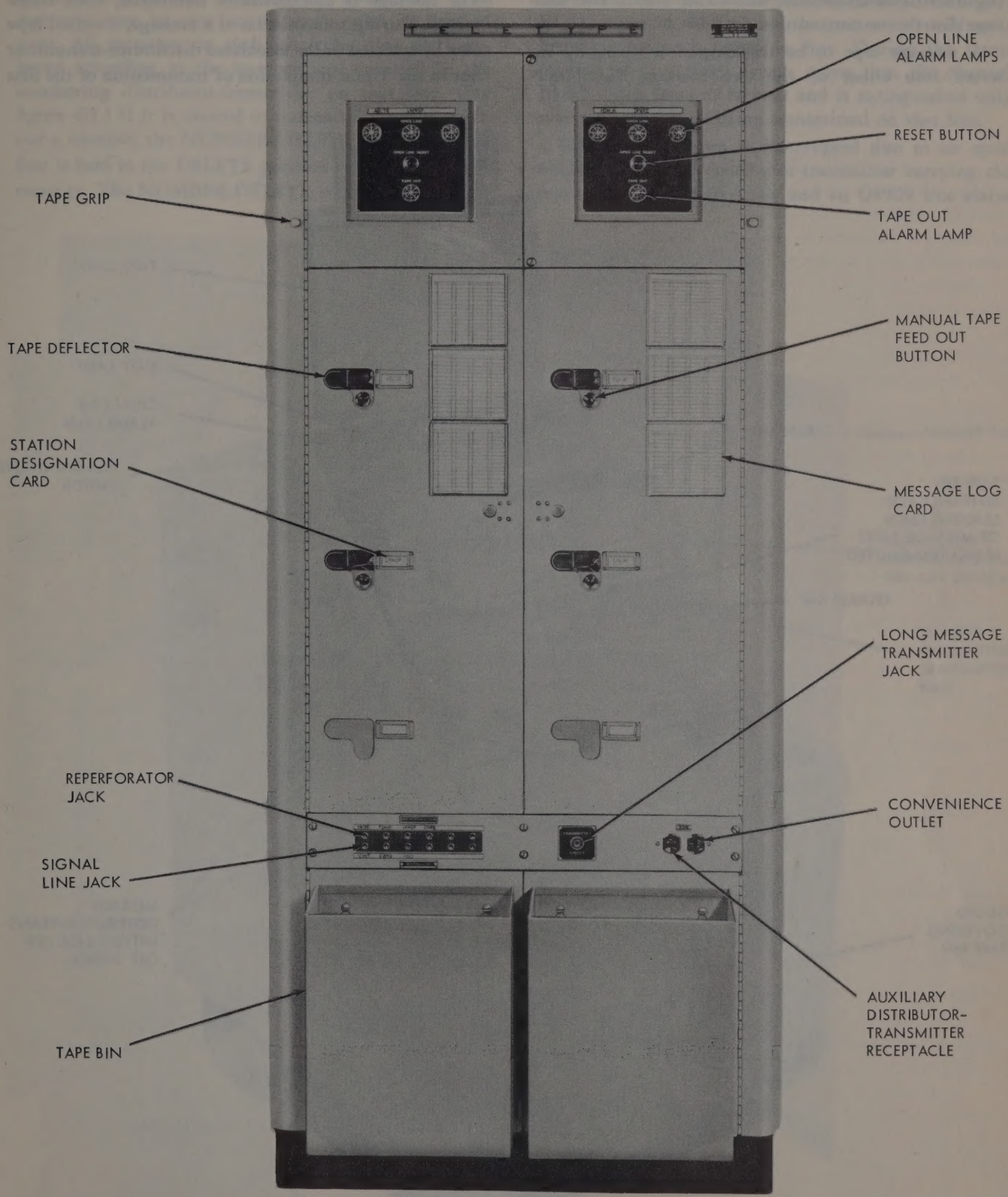


Figure 4—1. Receiver Group OA-616/FGC-38, OA-619/FGC-38X, or OA-622/FGC-39, Front View

Each outgoing signal line uses alternately one numbering distributor-transmitter and either one of two message distributor-transmitters.

A message tape to be transmitted is manually inserted into either of the two message distributor-transmitters associated with a particular outgoing line. The message is automatically numbered, then transmitted. During transmission of a message, a second tape may be inserted in the associated distributor-transmitter not in use. Upon completion of transmission of the first

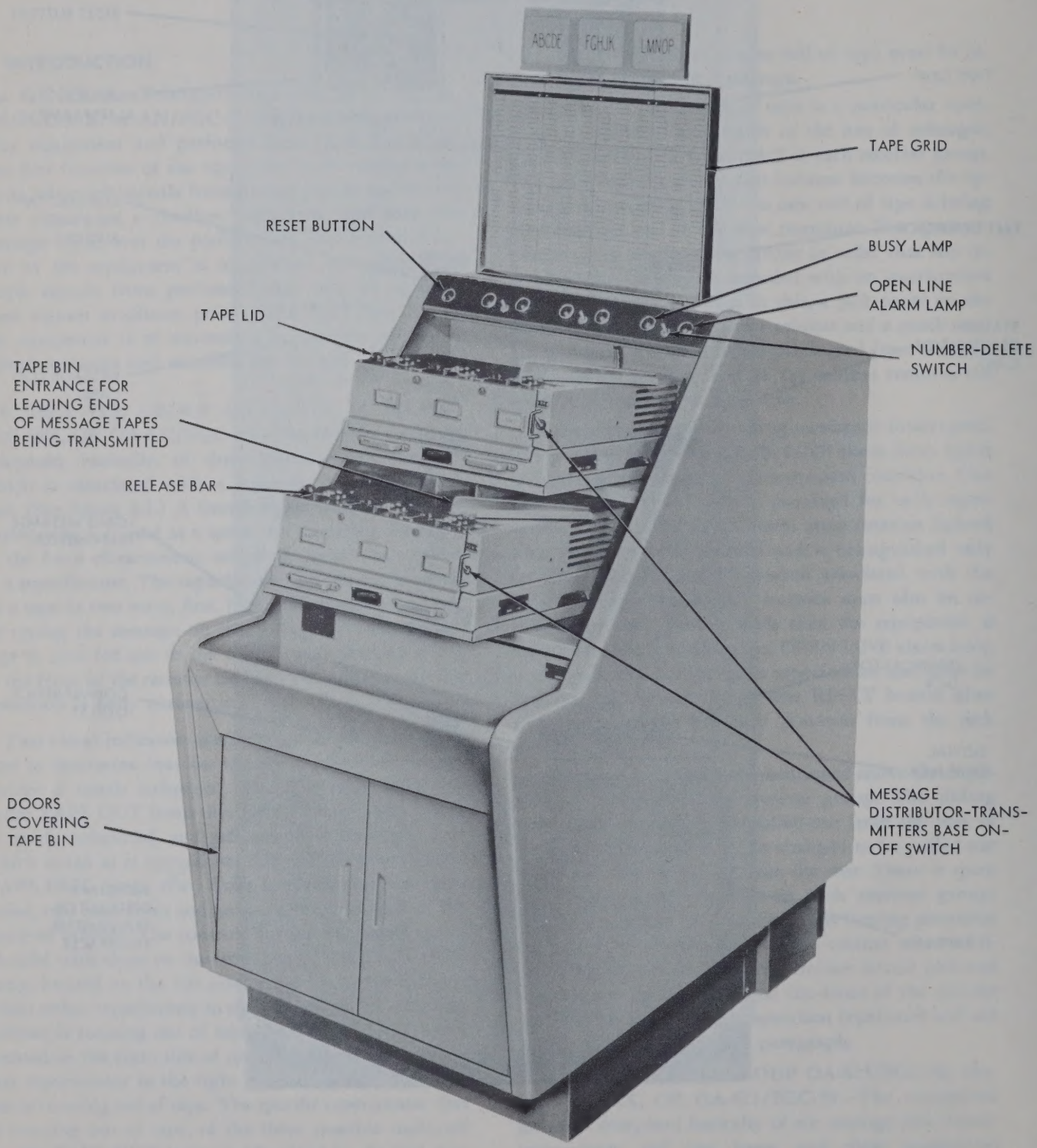


Figure 4—2. Transmitter Group OA-615/FGC-38, OA-618/FGC-38X, or OA-621/FGC-39, Front View

message, the message in the second distributor-transmitter is automatically numbered and transmitted. Thus messages may be sent continuously with no loss of time. All messages on each particular line are numbered according to the number tape inserted in the numbering distributor-transmitter on that line. (See figure 4-3.) If it is desired to transmit a message without a number, the NUMBER-DELETE switch for that line is held in the DELETE position while starting the message. The NUMBER-DELETE switches are located on the front panel of the transmitter cabinet, directly above the message distributor-transmitters. A channel BUSY lamp on the front of the transmitter cabinet is provided for each outgoing line. During the transmission of a message over a given line, the channel BUSY lamp remains lighted and is extinguished only when no message is being transmitted on that line.

When transmission is interrupted due to an open outgoing line, the distributor-transmitter carrying the message stops automatically and an OPEN line alarm

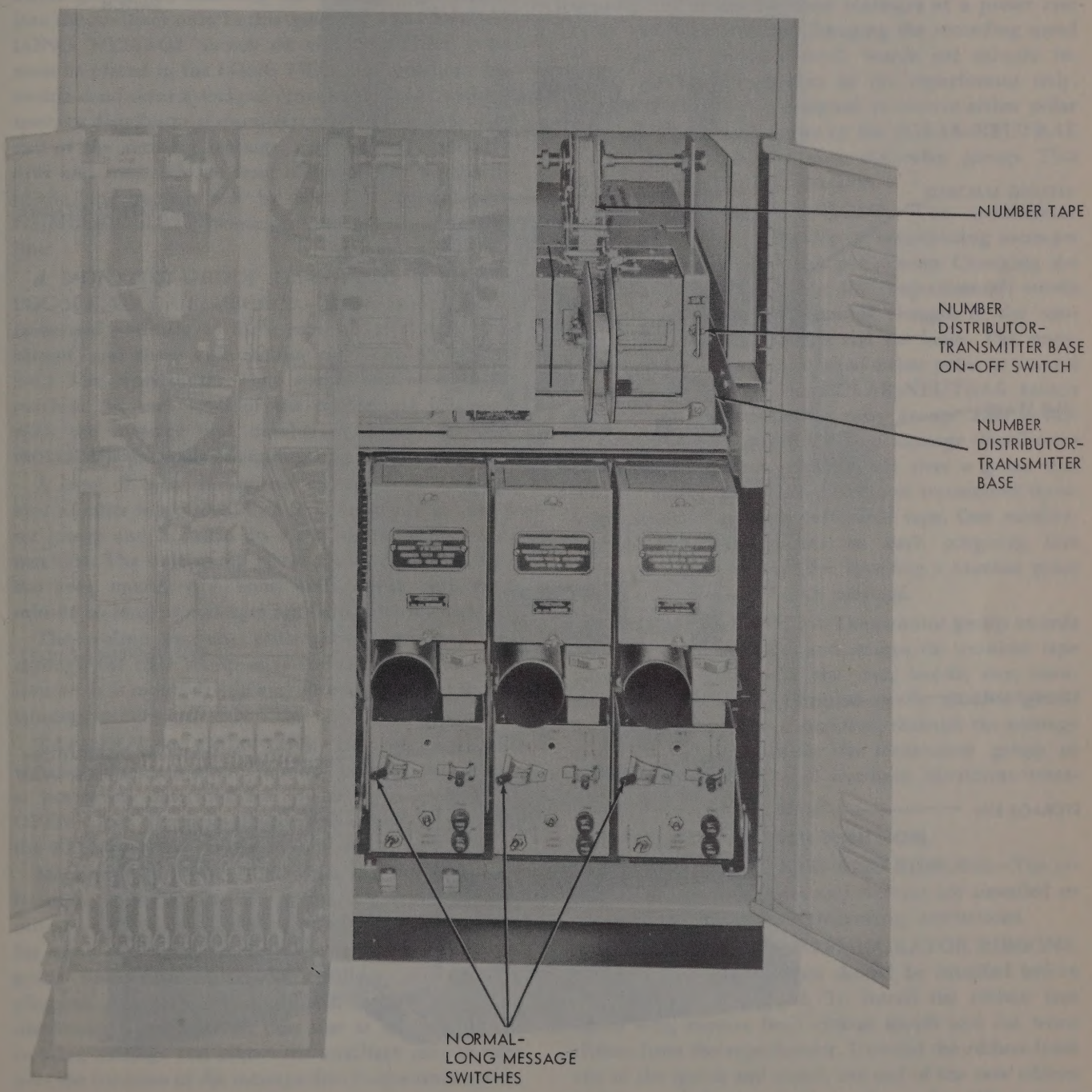


Figure 4—3. Transmitter Group, Rear View

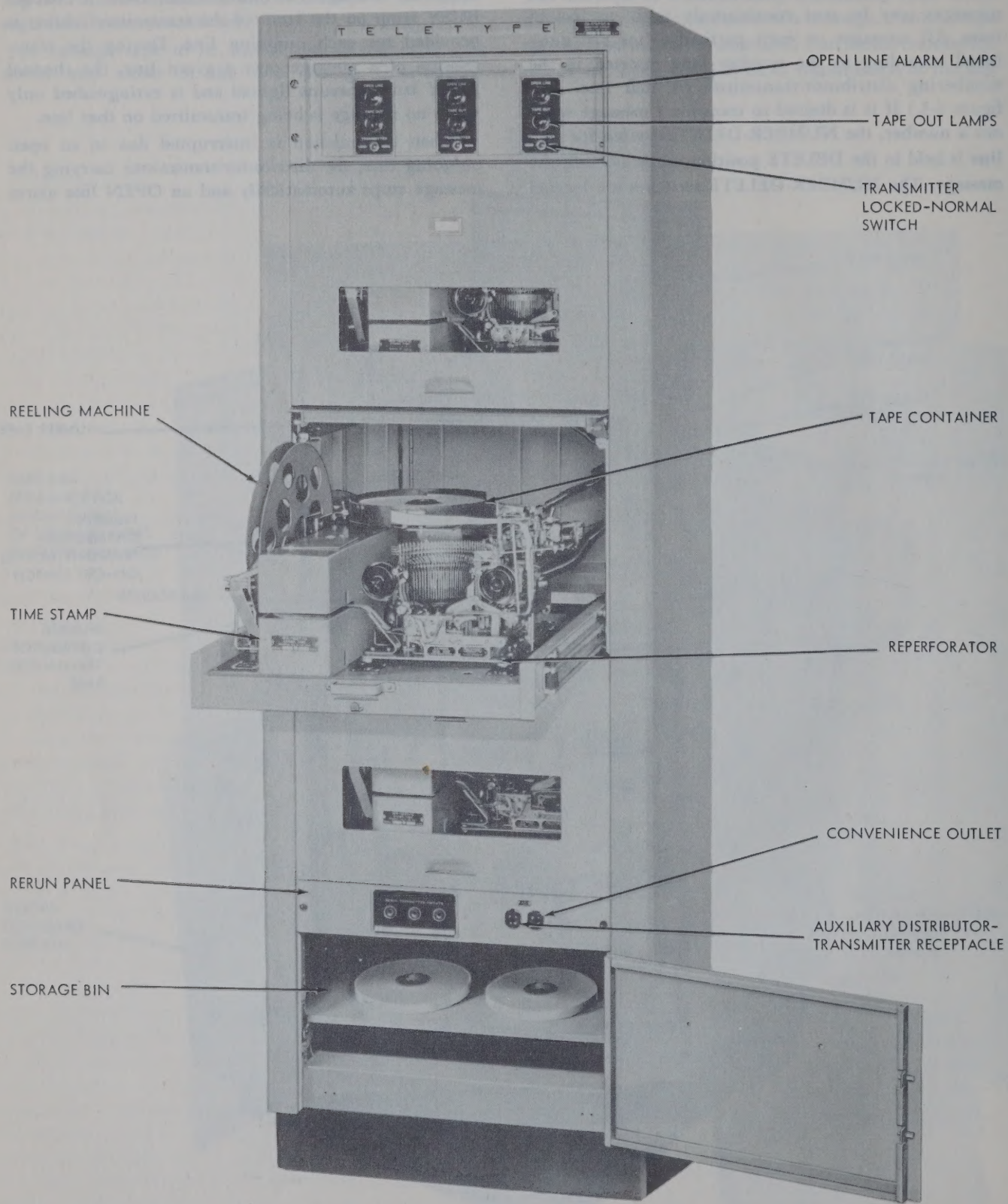


Figure 4—4. Monitor Group OA-617/FGC-38, OA-620/FGC-38X, or OA-623/FGC-39, Front View

lamp, associated with that line, lights. After the line has been restored, the RESET button must be depressed to extinguish this lamp. The message distributor-transmitter then automatically resumes normal operation at that point where transmission stopped.

If the equipment is wired for long message facilities, a long message being received may be transmitted directly from the receiver group without tearing the tape by connecting an auxiliary distributor-transmitter unit, specially wired with a three-conductor plug, at the receiver group and inserting the message tape directly into the auxiliary unit. In this operation, the NORMAL-LONG MESSAGE switch on the transmitter group must be placed in the LONG MESSAGE position. This switch conditions a lockout circuit associated with the message distributor-transmitters on that line and, at the end of the running message, the auxiliary unit takes over and transmits the long message. The numbering of the long message may be deleted by operating the NUMBER-DELETE switch on the relay group for that line.

d. MONITOR GROUP OA-617/FGC-38, OA-620/FGC-38X, OR OA-623/FGC-39.—The monitor group is composed basically of three reperforators, three time stamps, and three tape reeling machines. (See figure 4-4.) The reperforator, time stamp, and tape reeling machine on each level of the cabinet are associated with the message and numbering distributor-transmitters of a particular outgoing line.

A copy of each transmitted message and its associated number is produced by a reperforator in the monitor group and is stored on a reel by the tape reeling machine. The time stamp marks the monitor tape with the year, month, day, hour, and minute once every minute so long as messages are being transmitted.

The reeling machine pulls the reperforated tape through the time stamp as it comes out of the reperforator. It is motor driven and clutch controlled so that winding occurs only when the tape is slack.

TAPE OUT and OPEN LINE alarm lamps are provided on the front of the monitor cabinet and operate as previously described for the receiver group. The OPEN LINE alarm lamp is extinguished by pressing the RESET button on the transmitter group.

Messages may be rerun from the monitor tape copy by using a specially wired auxiliary distributor-transmitter unit. Provisions are made in the monitor cabinet for rerun messages by RERUN jacks (one for each outgoing line), into which the auxiliary unit may be plugged. Any jack, when utilized, locks the message distributor-transmitter on that line at the end of the running message and allows the auxiliary unit to take over the function of the message distributor-transmitter.

In case it is necessary to change the tape on any one of three lines in the monitor group, the TRANSMITTER LOCKED-NORMAL switch is placed in the LOCKED position. The switch stops the distributor-transmitters from transmitting at the end of the running message so that the tape may be changed without any loss of monitoring. Returning the switch to the NORMAL position allows the message distributor-transmitters to resume operation.

2. CAPABILITIES AND LIMITATIONS.

a. RECEIVER GROUP.—The receiver group as supplied is capable of receiving three messages simultaneously and recording these messages at a preset rate of 60 words per minute. Changing the recording speed to 75 or 100 (experimental) words per minute involves mechanical changes in the reperforator only. The receiver group is designed to receive either polar or neutral signals, as preset by the POLAR-NEUTRAL switch located on the receiving relay group. This switch is locked in a set position.

b. TRANSMITTER GROUP.—The transmitter group as supplied is capable of transmitting messages at a preset rate of 60 words per minute. Changing the transmitting speed to 75 or 100 (experimental) words per minute involves mechanical changes in the message distributor-transmitters and the bases. The transmitter group is designed to send either polar or neutral signals, as preset by the POLAR-NEUTRAL switch located on the transmitting relay group. This switch is locked in a set position. Two message distributor-transmitters transmit consecutively over a given line without loss of time. Each distributor-transmitter transmits manually inserted, perforated tape. One numbering distributor-transmitter on each outgoing line utilizes a numbered tape for inserting a number prior to the transmission of each message.

c. MONITOR GROUP.—The monitor group records all transmitted messages and stamps the monitor tape once every minute with the year, month, day, hour, and minute. Messages recorded by the monitor group may be retransmitted, if required, through the message distributor-transmitters in the transmitter group or through a specially wired auxiliary distributor-transmitter at the monitor group.

3. OPERATION OF EACH FUNCTION.

a. INSTALLING TAPES AND RIBBONS.—The receiver and monitor tapes and ribbons are installed or changed according to the following instructions.

(1) INSTALLING REPERFORATOR RIBBONS.—The reperforator ribbons should be installed before the machine is operated. To install the ribbon (see figure 4-5), remove both ribbon spools and the worn ribbon from the reperforator. Unwind the ribbon from one of the spools and attach one end of the new ribbon to this spool. Replace both spools on the ribbon spool shafts with the ribbon unwinding from the bottom of

both spools, passing over the ribbon rollers, through the slots in the ribbon reverse arms, and under the center loop of the ribbon guide.

(2) INSTALLING RECEIVER MESSAGE TAPE. —The message tape should be installed before the machine is operated (see figure 4-6). Place the new roll of tape in the tape container. The new roll of tape should unwind up and toward the right side of the cabinet. Feed the tape through the guides, through the tape chute and the punch block. Lift the feed wheel tape

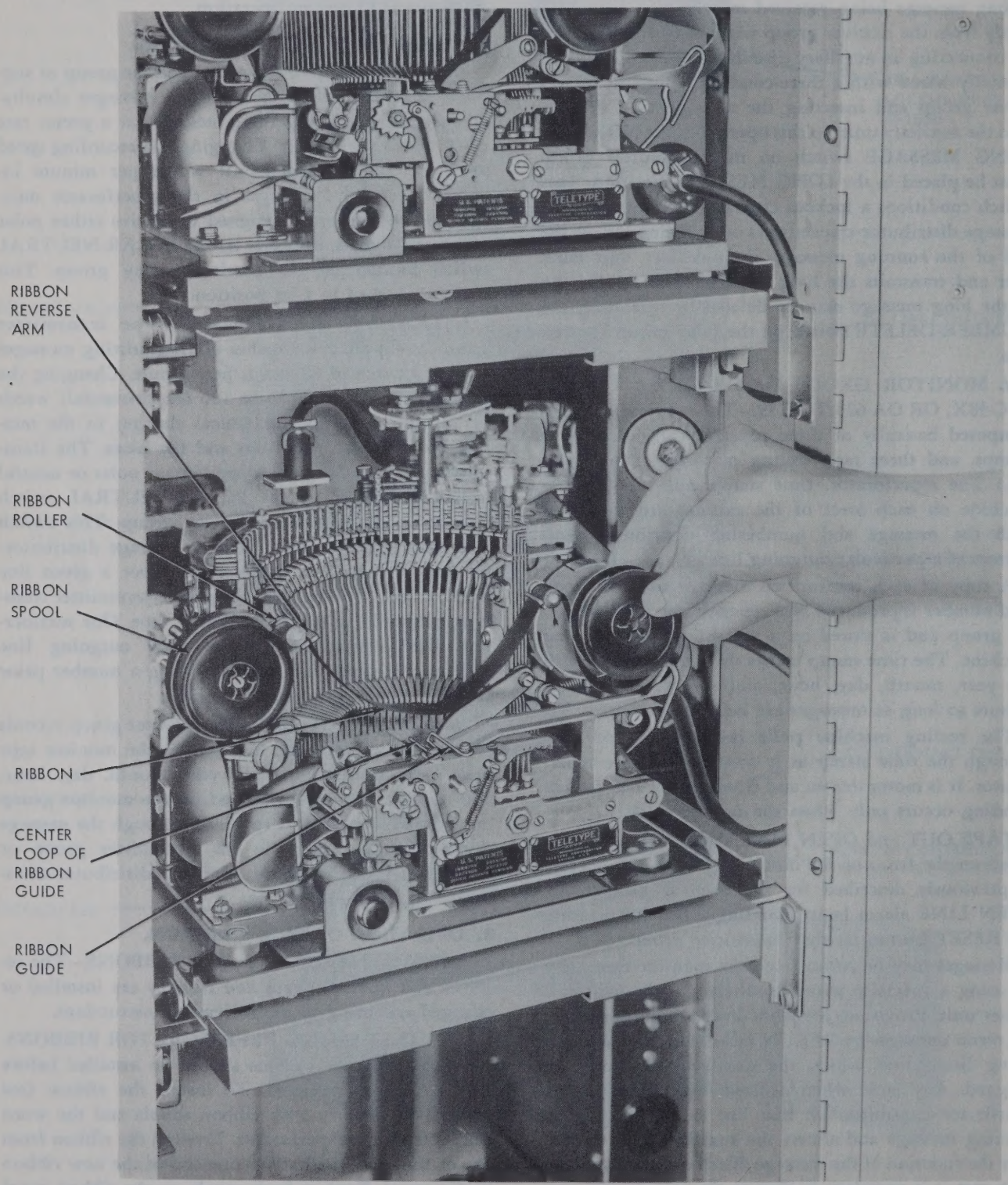


Figure 4—5. Installing Reperforator Ribbons

spring, place the tape over the feed wheel, and let the tape spring spring back into place over the feed wheel. Operate the tape feed-out lever to feed out a short amount of tape to insure proper feeding. Take the slack

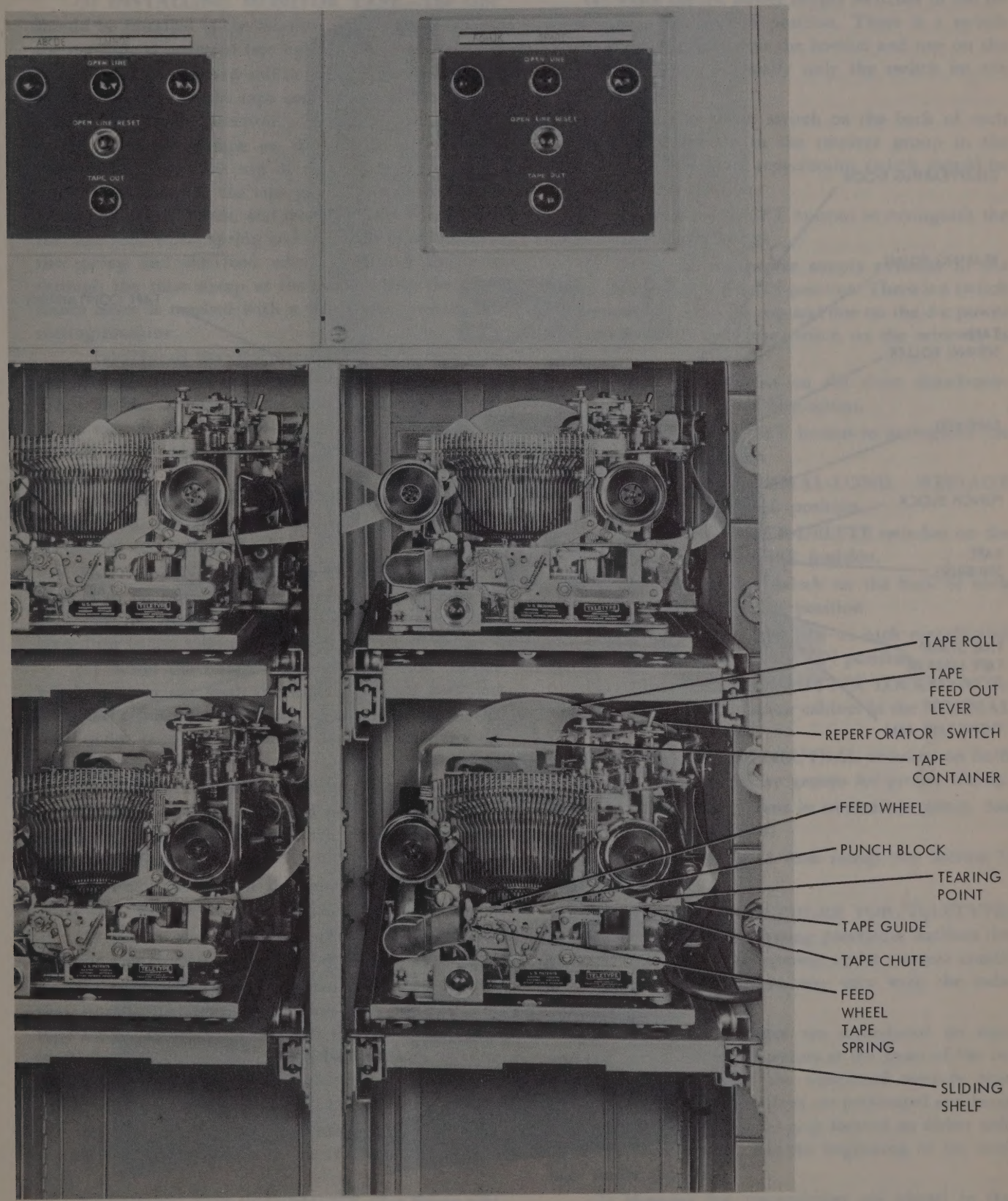


Figure 4—6. Installing Receiver Reperforator Tape

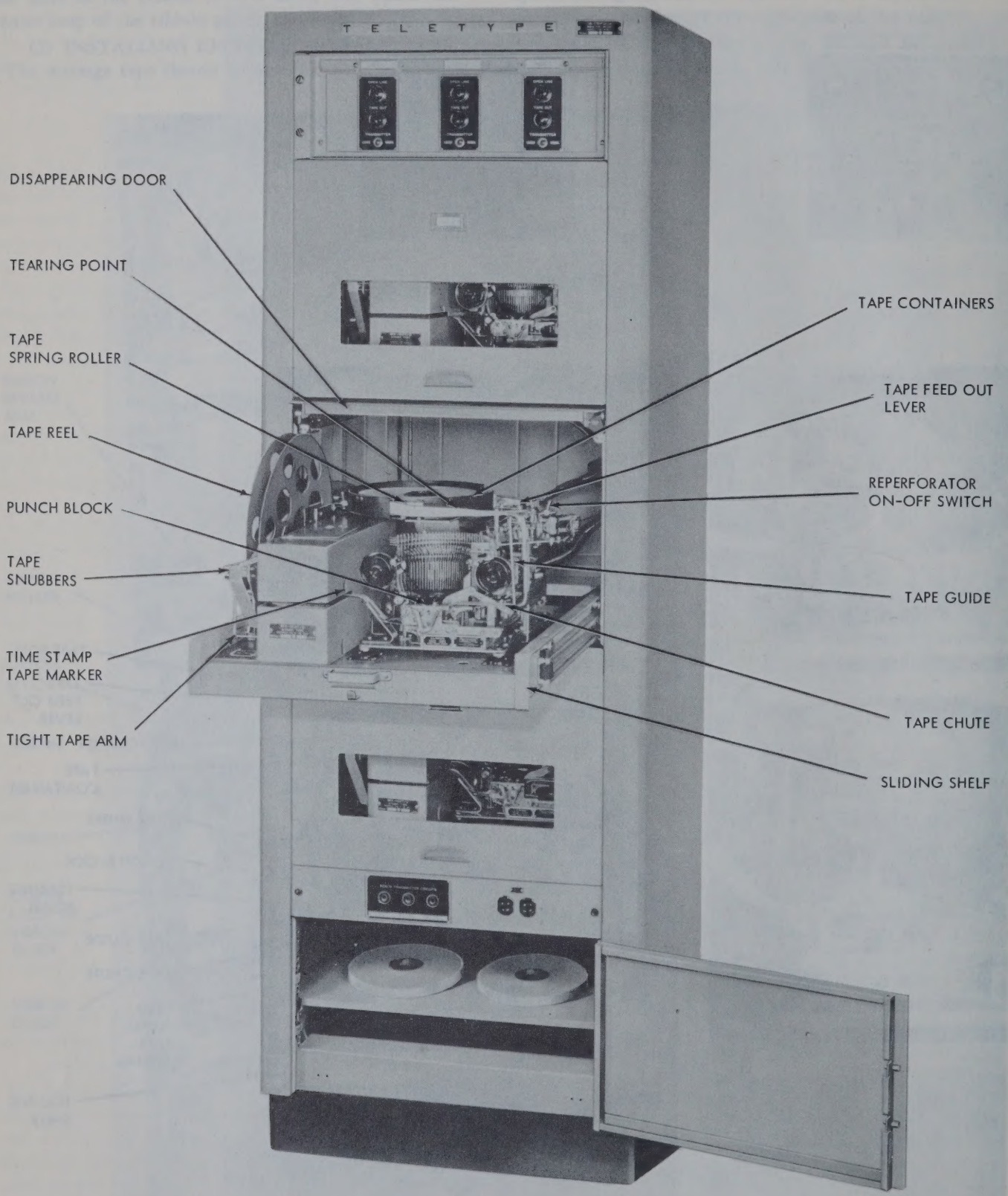


Figure 4–7. Installing Monitor Reperforator Tape

out of the tape by winding back onto the roll in the tape container.

(3) INSTALLING MONITOR TAPE.—The tape should be installed in the monitor reperforators before the machine is operated (see figure 4-7).

(*a*) Place the new roll in the tape container with the leading edge of the tape coming out of the roll in a counterclockwise direction.

(*b*) Pass the tape on the outside of the tape spring roller, over the top of tape guide, then down under the bottom of the tape guide, through the tape chute and punch block, and over the feed wheel. Lift the tape feed wheel spring and place the tape between the spring and the feed wheel. Continue the tape through the time stamp at the place where the time stamp cover is marked with a white line, and to the reeling machine.

(*c*) Thread the tape through the tight tape arm and through the tape snubbers on the reeling machine, following the line around the snubbers. Fasten the end of the tape to the reel. Operate the tape feed-out lever to feed out a short amount of tape to insure proper feeding.

(*d*) Take up any slack in the tape by winding the tape on the tape reel. Place the reel in the rear notches of the reeling machine.

b. INSTALLING NUMBER TAPES.—A number tape is to be provided for each outgoing line. Once each day the number tape must be inserted or reset according to the following procedure:

(1) Wind the number tape clockwise on the rewind reel starting with the high-numbered end and with the typing on the inside of the reel. Wind the tape under tension so that the tape is not loose on the reel.

(2) Position the snubber assembly to the rear.

(3) Pass the beginning end of the tape (printed side now facing upward) over the slack arm and the stationary snubbers.

(4) Place the end of the tape in the slot of the wind reel. Rotate the reel by hand two revolutions.

(5) Return the snubber assembly to the operating position and latch it in place.

(6) Press the release bar down and to the rear on that numbering distributor-transmitter. Position the tape for transmission of the next desired number and latch the tape lid down. Restore the release bar. Numbering transmission is now automatic.

(7) To rewind the tape, raise the tape lid, position the snubbers to the rear, and carefully and steadily rewind the tape by means of the crank on the rewind reel.

c. STARTING THE EQUIPMENT. *(See figure 4-9).* —The following procedure outlines the necessary steps to operate the equipment when first installed or after shutdown.

(1) Place the d-c power supply switches in the receiver group in the ON position. There is a switch on the right wireway near the bottom and one on the d-c power supply. Normally only the switch on the wireway is used.

(2) Place the motor switch on the back of each operating reperforator in the receiver group in the ON position. The spare reperforator switch should be left in the OFF position.

(3) Depress the RESET buttons to extinguish the OPEN LINE alarm lamps.

(4) Place the d-c power supply switches in the transmitter group in the ON position. There is a switch on the wireway near the top and one on the d-c power supply. Normally only the switch on the wireway is used.

(5) Place the switches on the three distributor-transmitter bases in the ON position.

(6) Depress the RESET button to extinguish the OPEN LINE alarm lamps.

(7) Place the NORMAL-LONG MESSAGE switches in the NORMAL position.

(8) Place the NUMBER-DELETE switches on the relay group in the NUMBER position.

(9) Place the motor switch on the back of each reeling machine in the ON position.

(10) Place the motor switch on each reperforator in the monitor cabinet in the ON position.

(11) Place the TRANSMITTER LOCKED-NORMAL switches on the monitor cabinet in the NORMAL position.

(12) Check POLAR-NEUTRAL switches on both sending and receiving relay groups for proper setting.

(13) Check line current in transmitter group. See Section 3, paragraph 3*b*(4).

(14) Check setting of time stamp. See Section 3, paragraph 3*c*(4).

d. OPERATING PROCEDURE FOR TELETYPEWRITER SET.—The following procedure outlines the steps to operate the equipment under normal conditions. The exact procedure may vary with the individual office.

(1) Incoming messages are reproduced on tape and fed out of the reperforators at the front of the receiver cabinet. Tear off the completed message tape where the letters combinations are perforated and hang the message under the tape grip located on either side of the receiver cabinet. Put the beginning of the message under the grip.

(2) Messages for transmission are placed in the proper slot in the grid on top of the transmitter cabinet

so that they protrude a few inches out the front. Care must be taken in placing the message tape in the grid slot. Since this is chadless tape, make certain that the *start-of-message* end of the tape is inserted in the grid. This is important to prevent the tape from jamming or tearing in the slot as it is withdrawn for transmission.

(3) Pull tape through slot in tape grid from front of grid.

(4) On the designated message distributor-transmitter, depress the release bar and push it backward until it locks in place.

(5) Insert the tape in the tape guide on the proper message distributor-transmitter and slide the tape under the tape lid until the first printed character is in line with the forward edge of the tape lid. If difficulty is experienced in inserting a tape into the message distributor-transmitter, raise the tape lid and place the tape (typed side up) in the tape guide so the feed pins on the feed wheel engage the feed holes in the tape. Return the tape lid to its latched position.

(6) Restore the release bar by moving it towards the front; transmission is now automatic.

(7) While the message is being transmitted, insert another message in the tandem distributor-transmitter and restore its release bar. When the first message is completed, the second distributor-transmitter takes over the circuit and automatically transmits the second message.

e. DELETING A NUMBER.—To delete a number from a message, hold the NUMBER-DELETE switch on the front panel in the DELETE position until transmission of the message has begun; then release the switch. This operation will delete the number from that message only.

f. TRANSMITTING LONG MESSAGES.—When it is necessary to transmit a long message while reception is still in progress, proceed with the following steps:

(1) Plug a specially wired distributor-transmitter into the auxiliary power receptacle on the receiver group panel and plug the signal cord into the TRANSMITTER CIRCUIT jack.

(2) Insert the start of the long message into the specially wired distributor-transmitter and turn the switch on the unit to the ON position. Make sure that the message tape is free to travel through the specially wired distributor-transmitter.

(3) Go to the transmitter group associated with the outgoing line on which the message is to be sent and place the proper NORMAL-LONG MESSAGE switch in the LONG DISTANCE position.

(4) The long message is transmitted as soon as the message being sent at the transmitter group is completed. The long message is preceded by a message number from the numbering distributor-transmitter if message numbering is used.

(5) When the long message is completed, turn off the switch on the specially wired distributor-transmitter. Also place the NORMAL-LONG MESSAGE switch in the NORMAL position. This restores the circuit to normal operation.

(6) Remove the specially wired distributor-transmitter cords from the receiver panel.

Notice to Operator

During a rerun from the monitor group, placing the NORMAL-LONG MESSAGE switch in the LONG MESSAGE position will interrupt the rerun message. Wait until the rerun message has been completed before operating the NORMAL-LONG MESSAGE switch.

g. RERUNNING MESSAGES.—To rerun a message with a number preceding the rerun, proceed with the following steps.

(1) Plug the specially wired distributor-transmitter power cord into the receptacle on the rerun panel.

(2) If a pilot tape is used, proceed with the following steps.

(*a*) Prepare the pilot tape and insert it into the specially wired distributor-transmitter.

(*b*) Place the ON-OFF switch on the specially wired distributor-transmitter in the ON position.

(*c*) Pull out the sliding shelf on which is mounted the tape reeling machine that has the reel with the message to be rerun. Move the reel to the forward notches of the machine so that the reel is free to rotate. Remove the tape from the snubbers and unwind the reel by pulling the tape until the desired message is located. Do not snarl the tape.

(*d*) Insert the plug of the signal cord of the specially wired distributor-transmitter into the proper jack on the RERUN panel. The unit automatically transmits as soon as the message from the distributor-transmitter on that line is completed.

(*e*) When the pilot tape has completed its transmission, place the switch on the specially wired distributor-transmitter to the OFF position. Insert the start of the rerun message and place the switch of the auxiliary distributor-transmitter to the ON position. The unit transmits the message automatically.

(3) If no pilot is used, proceed with the following steps.

(*a*) Locate the start of the rerun message on the monitor reel by placing the reel on the forward notches of the reeling machine so that the reel is free to rotate and unwind the tape until the message is found.

(*b*) Insert the start of the message in the specially wired distributor-transmitter and place the switch in the unit to the ON position.

(*c*) Insert the plug of the signal cord of the specially wired distributor-transmitter into the proper jack on the rerun panel. The unit automatically transmits as soon as the message from distributor-transmitter on that line is completed.

(4) At the end of the message, place the switch on the specially wired distributor-transmitter to the OFF position, pull the signal cord out of the RERUN panel and pull the power cord from the auxiliary receptacle. Transmitter and monitor group operation is now restored to normal.

h. NUMBER DELETE FOR LONG MESSAGE OR RERUN.—To delete a number on a long message or rerun, perform the following:

(1) On long messages, position the NUMBER-DELETE switch on the transmitting relay group to DELETE at the same time the LONG MESSAGE switch is positioned to LONG MESSAGE. Restore both switches at same time after long message is completed.

(2) On rerun message, position the NUMBER-DELETE switch on the relay group to DELETE position before inserting signal plug of specially wired distributor-transmitter into TRANSMITTER CIRCUIT jack. The switch may be restored to normal position any time after the start of the rerun message. Normal transmission will not take place until the NUMBER-DELETE switch is restored to NUMBER position.

i. REPLACING TAPE IN RECEIVER GROUP.—When it is necessary to place a new roll of tape in the TAPE CONTAINER, proceed as follows:

(1) Insert one end of the patching cord into the REPERFORATOR jack of the spare reperforator. The reperforator will start to operate as if on open line and the OPEN LINE alarm lamp will indicate an open line.

(2) Insert the other end of the patching cord into the SIGNAL LINE jack of the operating position. This must always be done after the first end is inserted into the REPERFORATOR jack of the spare or an open line will prevail until both plugs are inserted. Reset the OPEN LINE alarm for the spare position. Both reperforators will now be receiving the message.

(3) Watch the operating reperforator for the end of the message in process at the time the spare reperforator was inserted. As soon as the end of the message is received, tear off the partial message received on the spare reperforator and discard. Open the door covering the operating position, turn the power switch on the operating reperforator to the OFF position, and withdraw the shelf from the cabinet.

(4) Tear the tape on the old roll near the right-hand end of the tape chute that feeds the tape into the reperforator. Remove the tape out alarm plug from its receptacle. The rotating tray can be rotated by releasing the holding stud (by pulling down on the thumb nut located on the underside of the sliding shelf in the right front area). This will make the tape more accessible if it is being replaced from the rear. Turn on the power to the reperforator and clear the tape by operating the tape feed-out lever located next to the range scale. Turn the power off.

(5) Replace the old tape roll in the TAPE CONTAINER with the new tape roll unwinding up and toward the right side of the cabinet. (See figure 4-6.) Feed the tape through the tape guide, through the tape chute, punch block, and feed wheel of the reperforator.

(6) If the rotating tray was rotated, restore it to its operating position. Replace the tape out alarm plug. Take the slack out of the tape by rewinding it on the roll. Turn the power on and check tape feeding. Restore the sliding shelf to its operating position and close the door.

(7) Watch for the end of the message being received. As soon as the end of the message has been received, pull out the plug of the patching cord from the SIGNAL LINE jack. This plug must be pulled out first to prevent an open line condition. Pull out the second plug. This will shut off the power to the spare reperforator. Reset OPEN LINE alarm on spare position.

j. REPLACING RIBBON IN RECEIVER GROUP.—When it is necessary to replace the ribbon, proceed as follows:

(1) Insert one end of the patching cord into the REPERFORATOR jack of the spare reperforator. The reperforator will start to operate as if on open line, and the OPEN LINE alarm lamp will indicate an open line.

(2) Insert the other end of the patching cord into the SIGNAL LINE jack of the operating position. This must always be done *after* the first end is inserted into the REPERFORATOR jack of the spare or an open line will prevail until both plugs are inserted. Reset the OPEN LINE alarm for the spare position. Both reperforators will now be receiving the message.

(3) Watch the operating reperforator for the end of the message so that the spare reperforator will take over on a new and complete message. As soon as the end of the message is received, open the door covering the operating position, turn the power switch on the operating reperforator to the OFF position, and withdraw the shelf from the cabinet.

(4) Remove both ribbon spools and the worn ribbon from the reperforator. Unwind the ribbon from one of the spools and attach one end of the new ribbon to

this spool. Replace both spools on the ribbon spool shafts with the ribbon unwinding from the bottom of both spools, passing over the ribbon rollers, through the slots in the ribbon reverse arms, and under the center loop of the ribbon guide.

(5) If the rotating tray was rotated and the tape out alarm plug removed, restore the tray to its operating position and replace the plug. Take the slack out of the ribbon by rewinding it on the spool. Turn the power on and check ribbon feeding. Restore the sliding shelf to its operating position and close the door.

(6) Watch for the end of the message being received. As soon as the end of the message has been received, pull out the plug of the patching cord from the SIGNAL LINE jack. This plug must be pulled out first to prevent an open line condition. Pull out the second plug; this will shut off the power to the spare reperforator. Reset OPEN LINE alarm on spare position.

k. REPLACING TAPES IN MONITOR GROUP.—When it is necessary to place a new roll of tape in the tape container on top of the reperforator, proceed as follows:

(1) Operate the TRANSMITTER LOCKED-NORMAL switch on the front panel that corresponds to the circuit to be held in the LOCKED position. This stops all transmission from the transmitting set on that line until the switch is restored to the NORMAL position. The message in process at the time of operating the switch is completed before the locking of the circuit takes place.

(2) Pull out the sliding shelf and wait until the reperforator stops operating. It will do so as soon as the message being sent has been completed.

(3) Tear the tape on the old roll near the right-hand end of the tape chute that feeds the tape into the reperforator.

(4) Remove the piece of tape remaining in the reperforator by operating the tape feed-out lever next to the range scale on the reperforator and holding the lever until all the tape has cleared the reperforator.

(5) Replace the used tape roll, but do not discard as it will be needed for the reeling machine reel. The new tape roll should unwind in a counterclockwise direction.

(6) Pass the tape on the outside of the tape tension spring roller, over the top of the tape guide, then down under the bottom of the tape guide, through the tape chute and punch block, through the feed roll, through the left hand tape chute, through the time stamp, and to the tape reeling machine (see figure 4-7).

(7) Whenever the tape roll is replaced, the tape reeling machine should be emptied and the new tape started.

(8) Clean off any lint and dust that has accumulated around the tape chutes, punch block, and feed roll.

(9) Let the tape reeling machine take up all the old tape.

(10) When all the old tape is reeled, lift the tape reel out of the reeling machine and place a piece of tape across the free end so that reeled tape will not unwind.

(11) Pull out the locking plate on the side of the reel that does not have the gear. Pull the two sections of the reel apart, being careful not to damage the reeled tape. The tape will stay with one section.

(12) Remove the reeled tape, with its cardboard insert, from the section of the reel. Label the reeled tape to prevent loss of identity.

(13) Clean the cores on both halves of the reel if necessary, making sure that the springs do not have pieces of tape, lint, or other particles underneath.

(14) Insert the used tape roll that was removed from the reperforator on the core of the section of the reel that has the gear. The used tape roll should still have some tape on it so that the new tape may be attached to it easily. The used tape roll should be inserted so that the tape winds up in a clockwise direction.

(15) Put the two halves of the reel together and place the reel on the forward notches of the reeling machine. Leave about 10 inches of tape unwound.

(16) Take the new tape passing through the time stamp and thread it through the tight tape arm and the tape snubbers. (If more tape is needed, operate the tape feed-out lever on the reperforator.) Fasten the end coming out of the snubbers to the end of the used roll on the reel.

(17) Take up the slack and make sure that the fastened end in the reel is covered with at least one turn of the unbroken tape.

(18) Move the reel to the rear notches of the reeling machine.

(19) Return the TRANSMITTER LOCKED-NORMAL switch to the NORMAL position. Supervise the monitoring for a few minutes to see that everything is operating normally.

(20) Move the sliding shelf back into the cabinet and close the door.

l. REPLACING THE RIBBON IN MONITOR REPERFORATOR.—When it becomes necessary to replace ribbon, proceed as follows:

(1) It is essential that printing on the tape should be easily readable. The ribbon should be replaced before the printing becomes too light.

(2) Operate the TRANSMITTER LOCKED-NORMAL switch as when the tape roll is being changed.

(3) Wait until the reperforator has stopped operating.

(4) To replace a ribbon, remove both ribbon spools and the worn ribbon from the reperforator. Unwind the ribbon from one of the spools and attach one end of the new ribbon to this spool. Replace both spools on the ribbon spool shafts with the ribbon unwinding from the bottom of both spools, passing over the ribbon rollers, through the slots in the ribbon reverse arms, and under the center loop of the ribbon guide (see figure 4-5).

(5) Restore the TRANSMITTER LOCKED-NORMAL switch to the NORMAL position.

m. CHANGING RIBBON IN TIME STAMP.—When it becomes necessary to replace the ribbon, proceed as follows:

(1) Slide out the shelf.

(2) Turn off power to tape reeling machine.

(3) Let tape run to get slack or operate tape feed-out lever on reperforator until tape is slack.

(4) Being careful not to tear the tape, slide the tape out of the time stamp and let the slack tape hang.

(5) Remove the time stamp plug and free the cord from all cable holders.

(6) Pick the front end of the time stamp up to clear the stud and slide the unit forward and off the shelf.

(7) Remove the attaching screw in the top of the cover and remove cover. The ribbon spools are held in position by brackets on the right side frame. These brackets are keyed to fit slots in the side frame and are locked in place with knurled thumb screws.

(*a*) Remove the two ribbon spool bracket thumb screws and remove the ribbon spool brackets, spools, and ribbon.

(*b*) When replacing the ribbon, make sure the spools both wind from the outside. The drive pin in the end of the spool must seat well into the spool drive disk, but the spool itself should be free of any binds.

(*c*) Replace the ribbon spool brackets, making sure they fit into the slots in the side frame. Secure the brackets with the thumb screws and replace the cover.

(8) Slide the stamp back onto the locating studs on the shelf.

(9) Plug power cord into receptacle and place cord in cable holders.

(10) Reset time as per instructions in Section 3, paragraph 3*c*(4).

(11) Place tape in time stamp.

(12) Check tape threading and turn on the power to the tape reeling machine.

(13) Take up all tape slack before sliding shelf back into the cabinet.

(14) Supervise for a few minutes to make sure operation is normal.

n. TRANSMITTING TO THE MONITOR GROUP ON OPEN LINE.—When traffic is heavy and an open line exists on one line in the transmitter group, the incoming messages may be recorded on the monitor tape, then retransmitted when the line is again in operation. To transmit to the monitor group during an open line condition, proceed with the following steps:

(1) If battery is supplied locally, insert an open plug into the CIRCUIT jack at the patch frame. This will close the line at the jack and permit transmission to the monitor.

(2) If battery is supplied remotely, insert a jack, connected to line battery, into the SET jack at the patch frame (observe polarity).

o. PATCHING AT THE KEY TRANSMITTING GROUP.—When the jack strips connected to one end of the transmitter cables are mounted in the patch frame of the KEY TRANSMITTER GROUP, the strips provide a patch board for switching circuits within the installation group. The patch board is used to switch circuits when office conditions demand temporary changes in the established routines. The procedure followed will depend on whether the line battery is supplied locally or remotely.

(1) When the line battery is supplied locally and no external synchronizing control is used, proceed as follows:

(*a*) Place one end of the patch cord into the CIRCUIT jack associated with the transmission line desired. Contacts on this jack provide a closed loop for the local transmitting circuit which is removed from the transmission line selected.

(*b*) Place the other end of the patch cord into the SET jack associated with the local transmitting circuit desired.

(2) When the line battery is supplied remotely and no external synchronizing control is used, proceed as follows:

(*a*) Place one end of the patch cord into the SET jack associated with the local transmitting circuit desired. Contacts on this jack provide a closed loop for the transmission line which is removed from the local transmitting circuit selected.

(*b*) Place the other end of the patch cord into the CIRCUIT jack associated with the desired transmission line.

(3) Additional patching is required following the steps outlined in subparagraph *o*.(1) or *o*.(2) when an external synchronizing control is used with the local transmitters.

(*a*) Place one end of a patch cord into the external synchronizing control CIRCUIT jack associated with the transmission line CIRCUIT jack described above.

(*b*) Place the other end of the patch cord into the external synchronizing control SET jack associated with the local transmitting circuit SET jack described above.

(4) To restore the circuits to normal, reverse the above procedures.

p. PATCHING AT THE KEY RECEIVER GROUP. —When the jack strips connected to one end of the receiver cables are mounted in the patch frame of the KEY RECEIVER GROUP, the strips provide a patch board for switching circuits within the installation group. The patch board is used to switch circuits when office conditions demand temporary changes in the established routines. The procedure followed will depend on whether the line battery is supplied remotely or locally.

(1) When the line battery is supplied remotely, proceed as follows:

(*a*) Place one end of the patch cord into the SET jack associated with the local receiving circuit desired. Contacts on this jack provide a closed loop for the receiving line which is removed from the local receiving circuit selected.

(*b*) Place the other end of the patch cord into the CIRCUIT jack associated with the desired receiving line.

(2) When the line battery is supplied locally, proceed at follows:

(*a*) Place one end of the patch cord into the CIRCUIT jack associated with the receiving line desired. Contacts on this jack provide a closed loop for the local receiving circuit which is removed from the receiving line selected.

(*b*) Place the other end of the patch cord into the SET jack associated with the local receiving circuit desired.

(3) To restore the circuits to normal, reverse the above proceedures.

4. SUMMARY OF OPERATION.

a. INSTALLING NUMBER TAPES. *(See figure 4-8.)*

(1) Wind the number tape clockwise on the rewind reel starting with the high-numbered end and with the typing on the inside of the reel.

(2) Position the snubber assembly to the rear and pass the beginning end of the tape (printed side now facing upwards) over the slack arm and the stationary snubbers.

(3) Place the end of the tape in the wind reel slot. Rotate the reel two revolutions by hand. Return the snubber assembly to the operating position and latch in place.

(4) Press the release bar down and to the rear, position the tape for the proper number, latch the tape lid down, and restore the release bar.

(5) To rewind the tape, raise the tape lid, position the snubbers to the rear, and carefully and steadily rewind the tape by means of the crank on the rewind reel.

b. STARTING THE EQUIPMENT. *(See figure 4-9.)*

(1) Place the d-c power supply switch and the wireway switch in the receiver group in the ON position.

(2) Place the motor switches on the back of each receiver reperforator in the ON position. Leave the spare reperforator switch in the OFF position.

(3) Depress the RESET buttons on the receiver group.

(4) Place the d-c power supply switch and the wireway switch in the transmitter group in the ON position.

(5) Place the switches on the three distributor-transmitter bases in the ON position.

(6) Depress the RESET buttons on the transmitter groups.

(7) Place the NORMAL-LONG MESSAGE switches in the NORMAL position.

(8) Place the NUMBER-DELETE switches on the relay groups in the NUMBER position.

(9) Place the motor switches on the reeling machines and monitor reperforators in the ON position.

(10) Place the TRANSMITTER LOCKED-NORMAL switches in the monitor group in the NORMAL position.

(11) Check the POLAR-NEUTRAL switches on both sending and receiving relay groups for proper setting.

(12) Check the line current in the transmitter group. See Section 3, paragraph 3*b*(4).

(13) Check the time stamp setting. See Section 3, paragraph 3*c*(4).

c. OPERATING PROCEDURES. *(See figure 4-10.)*

(1) Tear off the completed message from the receiver group reperforators.

(2) Hang the message under the spring clip on either corner of the receiver cabinet with the beginning of the message under the clip.

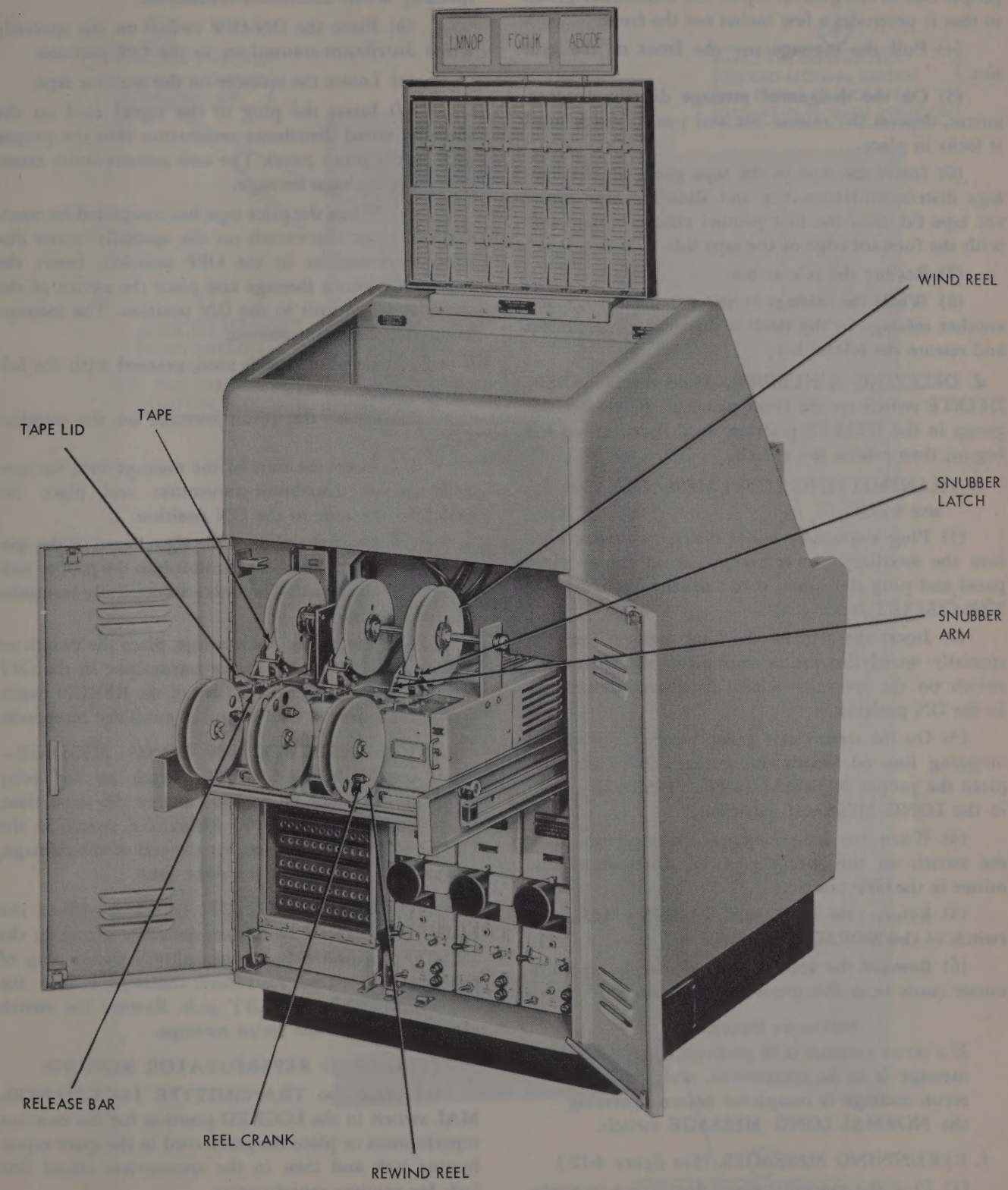


Figure 4–8. Transmitter Group, Rear View, Changing the Number Tape

(3) Insert the beginning of each message in the proper slot in the grid on top of the transmitter group so that it protrudes a few inches out the front.

(4) Pull the message out the front of the grid slot.

(5) On the designated message distributor-transmitter, depress the release bar and push it back until it locks in place.

(6) Insert the tape in the tape guide on the message distributor-transmitter and slide the tape under the tape lid until the first printed character is in line with the forward edge of the tape lid.

(7) Restore the release bar.

(8) While the message is being transmitted, insert another message in the tandem distributor-transmitter and restore the release bar.

d. DELETING A NUMBER.—Hold the NUMBER-DELETE switch on the front panel of the transmitter group in the DELETE position until transmission has begun; then release the switch.

e. TRANSMITTING LONG MESSAGES. *(See figure 4-11.)*

(1) Plug a specially wired distributor-transmitter into the auxiliary power receptacle on the receiver panel and plug the signal cord into the TRANSMITTER CIRCUIT jack.

(2) Insert the start of the long message into the specially wired distributor-transmitter and place the switch on the specially wired distributor-transmitter in the ON position.

(3) On the transmitter group associated with the outgoing line on which the message is to be sent, place the proper NORMAL-LONG MESSAGE switch in the LONG MESSAGE position.

(4) When the long message is completed, place the switch on the specially wired distributor-transmitter in the OFF position.

(5) Return the NORMAL - LONG MESSAGE switch to the NORMAL position.

(6) Remove the specially wired distributor-transmitter cords from the receiver group panel.

Notice to Operator

If a rerun message is in progress when a long message is to be transmitted, wait until the rerun message is completed before operating the NORMAL-LONG MESSAGE switch.

f. RERUNNING MESSAGES. *(See figure 4-12.)*

(1) Plug the specially wired distributor-transmitter power cord into the auxiliary power receptacle on the front panel of the monitor group.

(2) If a pilot tape is used, proceed with the following steps:

(*a*) Prepare the pilot tape and insert it into the specially wired distributor-transmitter.

(*b*) Place the ON-OFF switch on the specially wired distributor-transmitter in the ON position.

(*c*) Locate the message on the monitor tape.

(*d*) Insert the plug of the signal cord on the specially wired distributor-transmitter into the proper jack on the rerun panel. The unit automatically transmits the pilot tape message.

(*e*) When the pilot tape has completed its transmission, place the switch on the specially wired distributor-transmitter in the OFF position. Insert the start of the rerun message and place the switch of the specially wired unit to the ON position. The message is automatically transmitted.

(3) If no pilot tape is used, proceed with the following steps:

(*a*) Locate the rerun message on the monitor reel.

(*b*) Insert the start of the message into the specially wired distributor-transmitter and place the switch in the unit to the ON position.

(*c*) Insert the plug of the signal cord of the specially wired distributor-transmitter into the proper jack in the RERUN panel. The unit automatically transmits the rerun message.

(4) At the end of the message, place the switch on the specially wired distributor-transmitter in the OFF position, pull the signal cord out of the RERUN panel, and pull the power cord from the auxiliary receptacle.

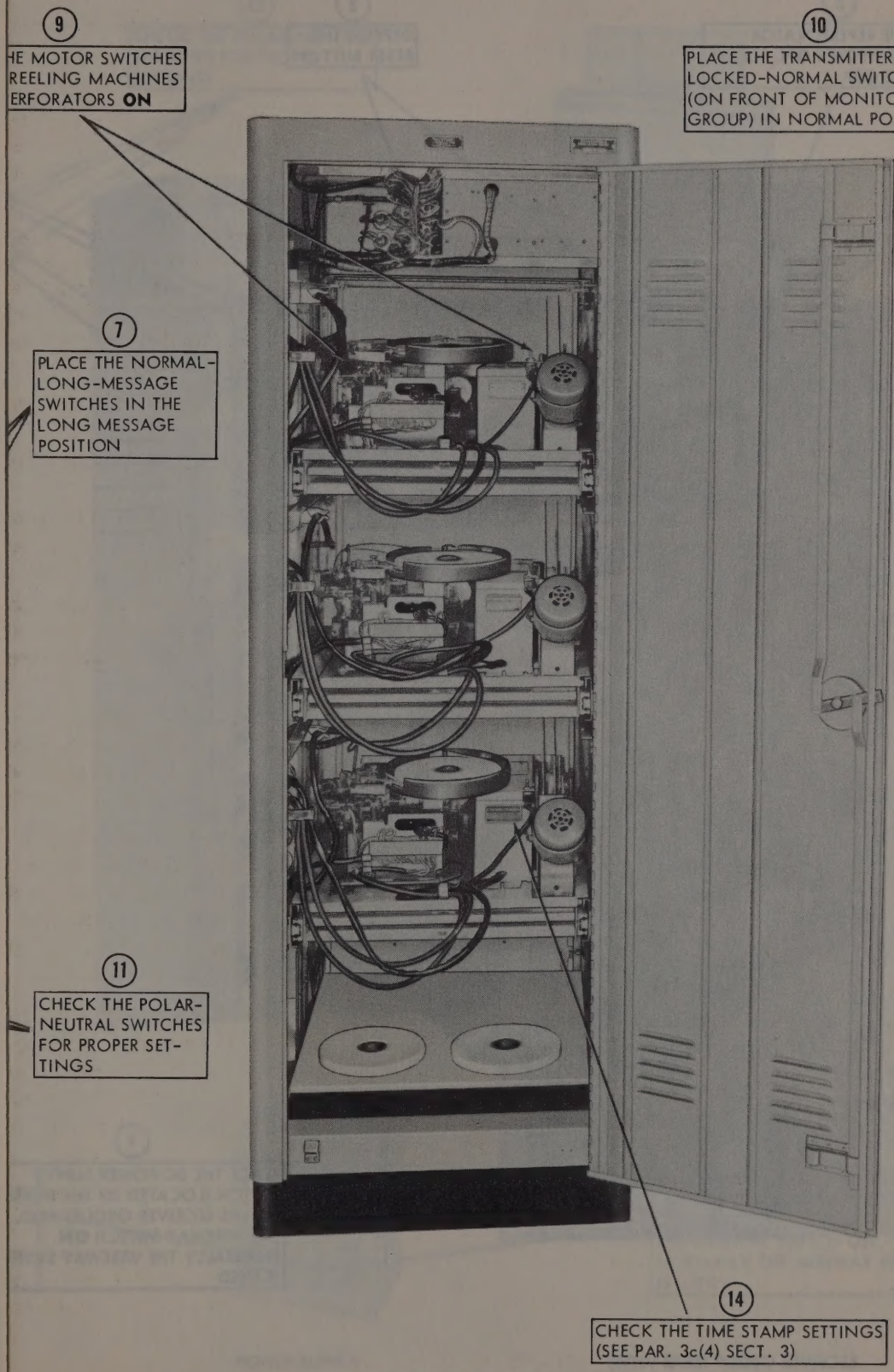
g. NUMBER-DELETE ON LONG MESSAGE.—Place the NUMBER-DELETE switch on the relay group to the DELETE position and at the same time, place the NORMAL-LONG MESSAGE switch in the LONG MESSAGE position. At the end of the message, restore both switches at the same time.

h. NUMBER-DELETE ON RERUN.—Place the NUMBER-DELETE switch on the relay group in the DELETE position before inserting the signal plug of the specially wired distributor-transmitter into the TRANSMITTER CIRCUIT jack. Restore the switch after the start of the rerun message.

i. CHANGING REPERFORATOR RIBBONS.

(1) Place the TRANSMITTER LOCKED-NORMAL switch in the LOCKED position for the monitor reperforators or place the patch cord in the spare reperforator jack and then in the appropriate signal line jack for receiver reperforators.

(2) Wait until the reperforator has stopped operating in the monitor group or until the end of the message in the receiver group, then place the reperforator switch in the OFF position.



MONITOR GROUP (REAR VIEW)

Figure 4—9. Teletypewriter Set, Starting Procedure

(3) Insert the beginning of each message in the proper slot in the grid on top of the transmitter group so that it protrudes a few inches out the front.

(4) Pull the message out the front of the grid slot.

(5) On the designated message distributor-transmitter, depress the release bar and push it back until it locks in place.

(6) Insert the tape in the tape guide on the message distributor-transmitter and slide the tape under the tape lid until the first printed character is in line with the forward edge of the tape lid.

(7) Restore the release bar.

(8) While the message is being transmitted, insert another message in the tandem distributor-transmitter and restore the release bar.

d. DELETING A NUMBER.—Hold the NUMBER-DELETE switch on the front panel of the transmitter group in the DELETE position until transmission has begun; then release the switch.

e. TRANSMITTING LONG MESSAGES. *(See figure 4-11.)*

(1) Plug a specially wired distributor-transmitter into the auxiliary power receptacle on the receiver panel and plug the signal cord into the TRANSMITTER CIRCUIT jack.

(2) Insert the start of the long message into the specially wired distributor-transmitter and place the switch on the specially wired distributor-transmitter in the ON position.

(3) On the transmitter group associated with the outgoing line on which the message is to be sent, place the proper NORMAL-LONG MESSAGE switch in the LONG MESSAGE position.

(4) When the long message is completed, place the switch on the specially wired distributor-transmitter in the OFF position.

(5) Return the NORMAL - LONG MESSAGE switch to the NORMAL position.

(6) Remove the specially wired distributor-transmitter cords from the receiver group panel.

Notice to Operator

If a rerun message is in progress when a long message is to be transmitted, wait until the rerun message is completed before operating the NORMAL-LONG MESSAGE switch.

f. RERUNNING MESSAGES. *(See figure 4-12.)*

(1) Plug the specially wired distributor-transmitter power cord into the auxiliary power receptacle on the front panel of the monitor group.

(2) If a pilot tape is used, proceed with the following steps:

(*a*) Prepare the pilot tape and insert it into the specially wired distributor-transmitter.

(*b*) Place the ON-OFF switch on the specially wired distributor-transmitter in the ON position.

(*c*) Locate the message on the monitor tape.

(*d*) Insert the plug of the signal cord on the specially wired distributor-transmitter into the proper jack on the rerun panel. The unit automatically transmits the pilot tape message.

(*e*) When the pilot tape has completed its transmission, place the switch on the specially wired distributor-transmitter in the OFF position. Insert the start of the rerun message and place the switch of the specially wired unit to the ON position. The message is automatically transmitted.

(3) If no pilot tape is used, proceed with the following steps:

(*a*) Locate the rerun message on the monitor reel.

(*b*) Insert the start of the message into the specially wired distributor-transmitter and place the switch in the unit to the ON position.

(*c*) Insert the plug of the signal cord of the specially wired distributor-transmitter into the proper jack in the RERUN panel. The unit automatically transmits the rerun message.

(4) At the end of the message, place the switch on the specially wired distributor-transmitter in the OFF position, pull the signal cord out of the RERUN panel, and pull the power cord from the auxiliary receptacle.

g. NUMBER-DELETE ON LONG MESSAGE.—Place the NUMBER-DELETE switch on the relay group to the DELETE position and at the same time, place the NORMAL-LONG MESSAGE switch in the LONG MESSAGE position. At the end of the message, restore both switches at the same time.

h. NUMBER-DELETE ON RERUN.—Place the NUMBER-DELETE switch on the relay group in the DELETE position before inserting the signal plug of the specially wired distributor-transmitter into the TRANSMITTER CIRCUIT jack. Restore the switch after the start of the rerun message.

i. CHANGING REPERFORATOR RIBBONS.

(1) Place the TRANSMITTER LOCKED-NORMAL switch in the LOCKED position for the monitor reperforators or place the patch cord in the spare reperforator jack and then in the appropriate signal line jack for receiver reperforators.

(2) Wait until the reperforator has stopped operating in the monitor group or until the end of the message in the receiver group, then place the reperforator switch in the OFF position.

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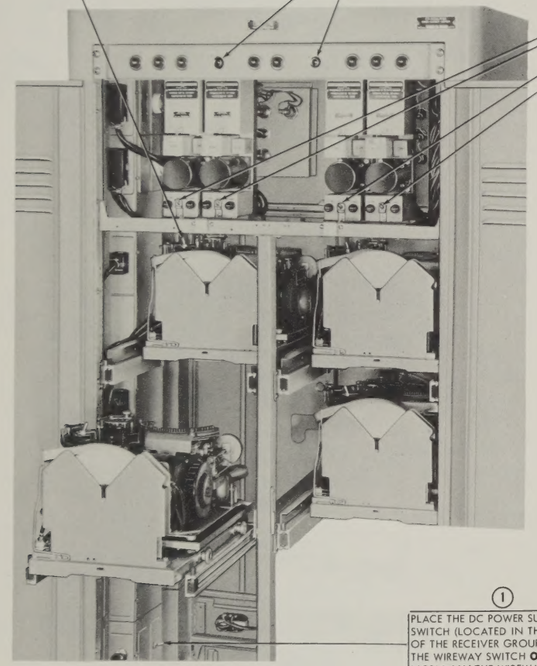


(2) PLACE THE REPERFORATOR MOTOR SWITCHES **ON**. LEAVE THE SPARE **OFF**

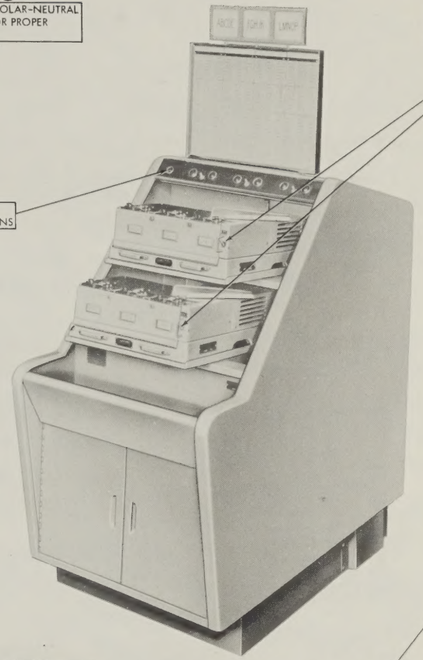
(3) DEPRESS THE RESET BUTTON

(1) PLACE THE DC POWER SUPPLY SWITCH (LOCATED IN THE BOTTOM OF THE RECEIVER GROUP) AND THE WIREWAY SWITCH **ON**. NORMALLY THE WIREWAY SWITCH IS USED

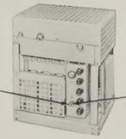
RECEIVER GROUP (REAR VIEW)

(12) CHECK THE POLAR-NEUTRAL SWITCHES FOR PROPER SETTINGS

(6) DEPRESS THE RESET BUTTONS



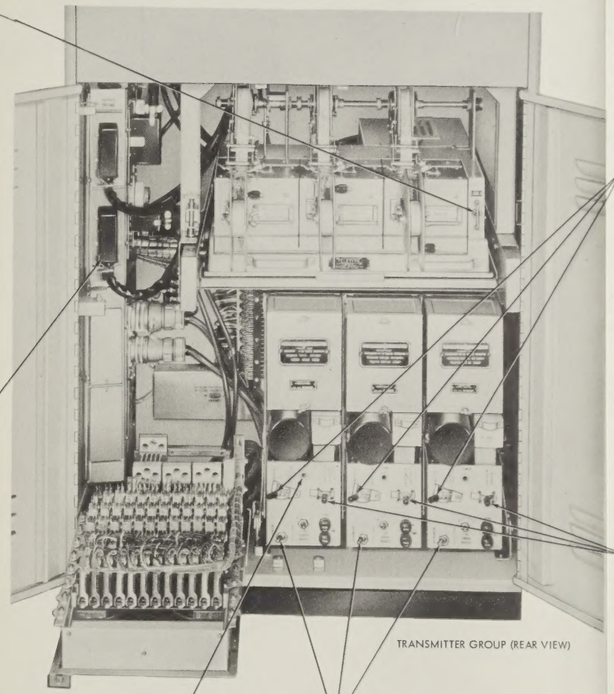
TRANSMITTER GROUP (FRONT VIEW)



POWER SUPPLY

(4) PLACE THE DC POWER SUPPLY SWITCH (LOCATED IN THE BOTTOM OF THE RECEIVER GROUP) AND THE WIREWAY SWITCH **ON**. NORMALLY THE WIREWAY SWITCH IS USED

(5) PLACE THE THREE DISTRIBUTOR-TRANSMITTER BASE SWITCHES **ON**



TRANSMITTER GROUP (REAR VIEW)

(13) CHECK THE LINE CURRENT (SEE PAR. 3b(4) SECT. 3)

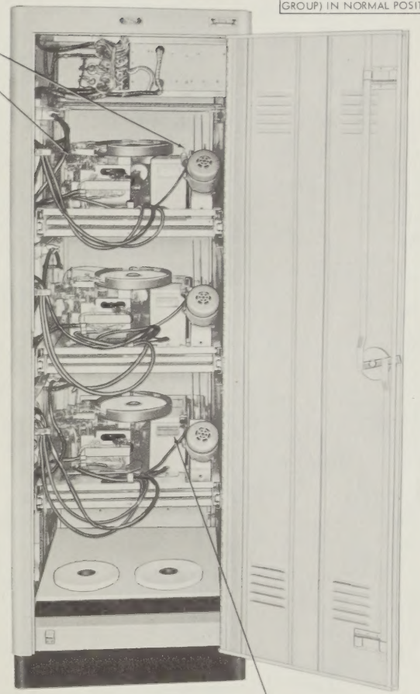
(8) PLACE THE NUMBER-DELETE SWITCHES IN THE NUMBER POSITION

(9) PLACE THE MOTOR SWITCHES ON THE REELING MACHINES AND REPERFORATORS **ON**

(7) PLACE THE NORMAL-LONG-MESSAGE SWITCHES IN THE LONG MESSAGE POSITION

(11) CHECK THE POLAR-NEUTRAL SWITCHES FOR PROPER SETTINGS

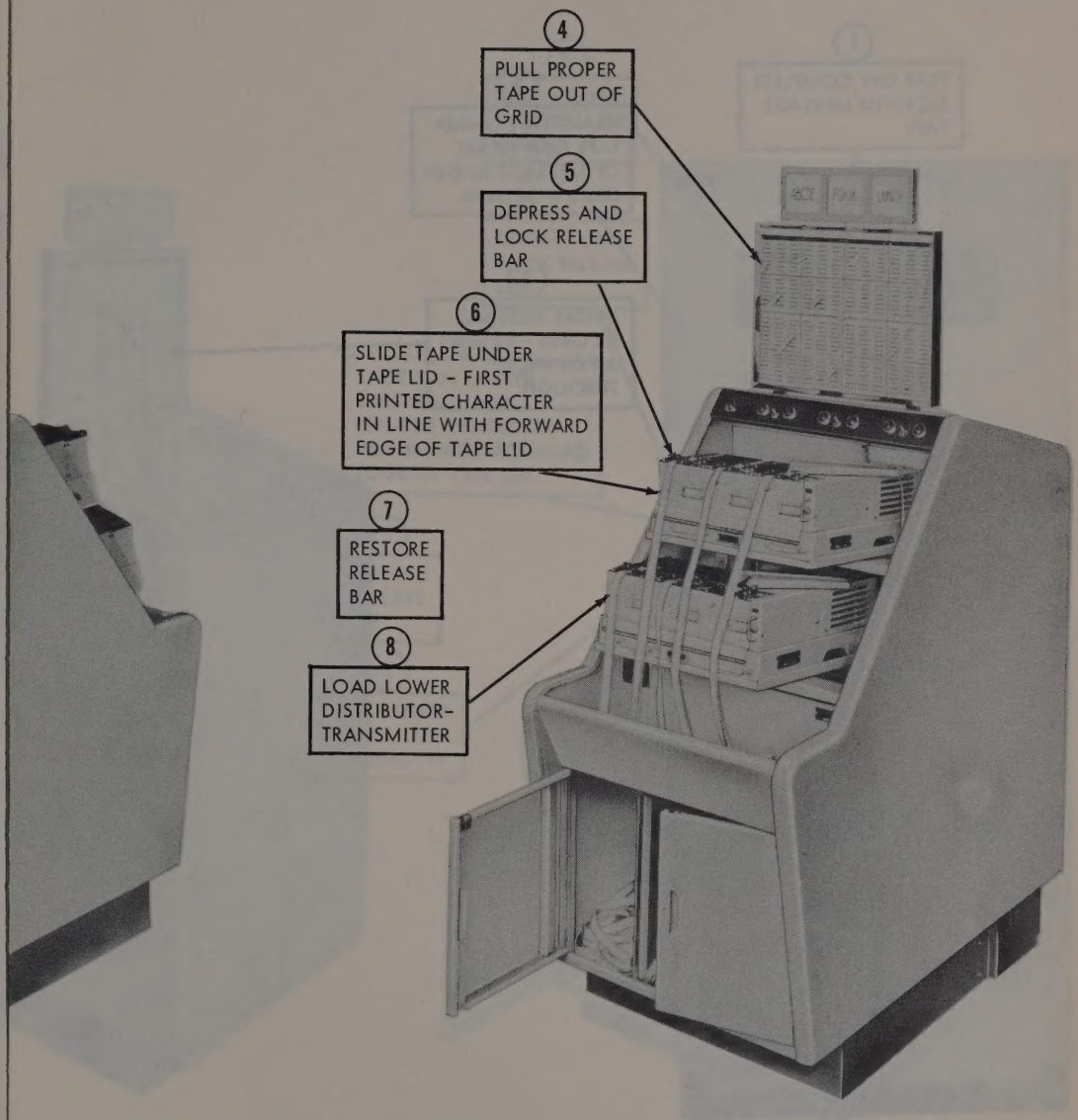
(10) PLACE THE TRANSMITTER LOCKED-NORMAL SWITCH (ON FRONT OF MONITOR GROUP) IN NORMAL POSITION



(14) CHECK THE TIME STAMP SETTINGS (SEE PAR. 3c(4) SECT. 3)

MONITOR GROUP (REAR VIEW)

Figure 4–9. Teletypewriter Set, Starting Procedure



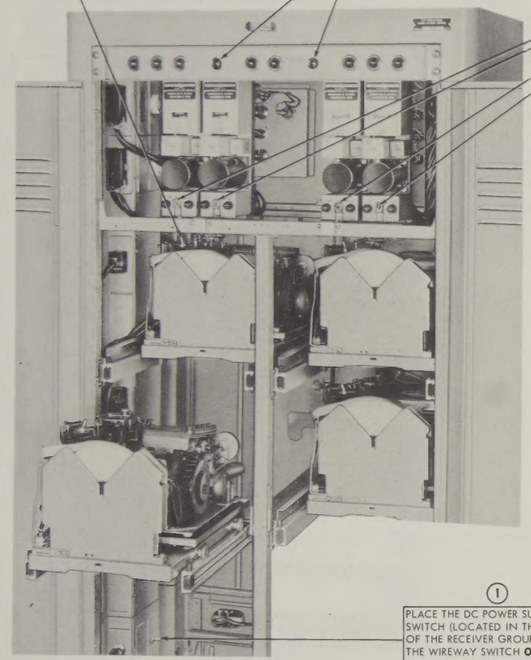
/IEW)

TRANSMITTER GROUP (FRONT VIEW)

Figure 4–10. Teletypewriter Set, Operating Procedure

NAVSHIPS 92378
AN/FGC-38, AN/FGC-38X, AN/FGC-39

NAVSHIPS 92378
AN/FGC-38, AN/FGC-38X, AN/FGC-39

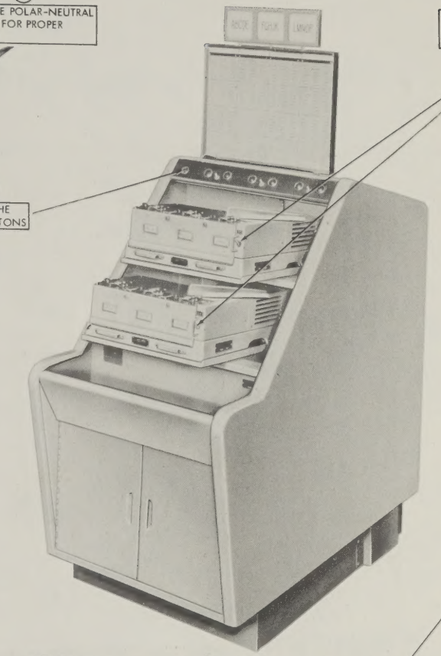


(2) PLACE THE REPERFORATOR MOTOR SWITCHES **ON**. LEAVE THE SPARE **OFF**

(3) DEPRESS THE RESET BUTTON

(1) PLACE THE DC POWER SUPPLY SWITCH (LOCATED IN THE BOTTOM OF THE RECEIVER GROUP) AND THE WIREWAY SWITCH **ON**. NORMALLY THE WIREWAY SWITCH IS USED

RECEIVER GROUP (REAR VIEW)



(12) CHECK THE POLAR-NEUTRAL SWITCHES FOR PROPER SETTINGS

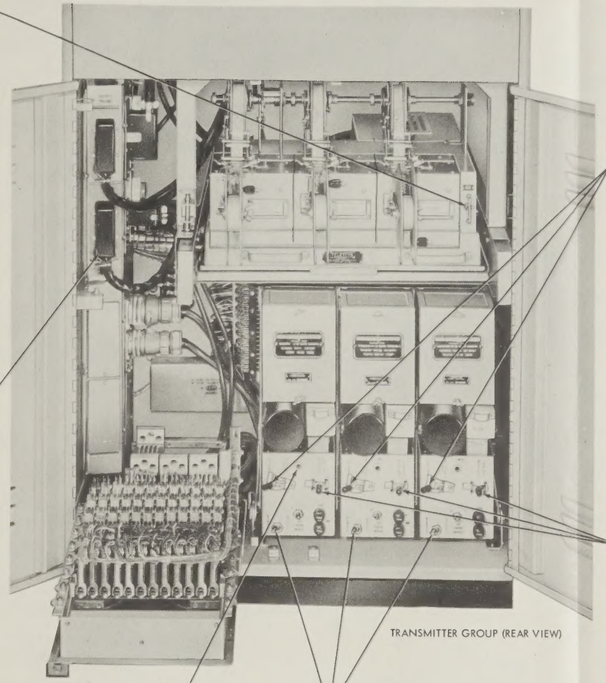
(6) DEPRESS THE RESET BUTTONS

TRANSMITTER GROUP (FRONT VIEW)

POWER SUPPLY

(5) PLACE THE THREE DISTRIBUTOR-TRANSMITTER BASE SWITCHES **ON**

(4) PLACE THE DC POWER SUPPLY SWITCH (LOCATED IN THE BOTTOM OF THE RECEIVER GROUP) AND THE WIREWAY SWITCH **ON**. NORMALLY THE WIREWAY SWITCH IS USED



TRANSMITTER GROUP (REAR VIEW)

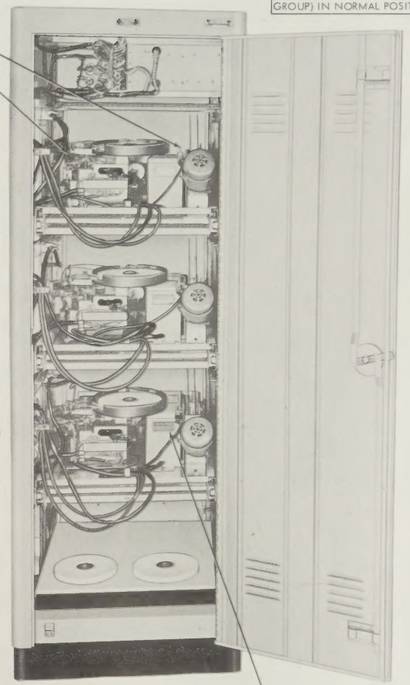
(9) PLACE THE MOTOR SWITCHES ON THE REELING MACHINES AND REPERFORATORS **ON**

(7) PLACE THE NORMAL-LONG-MESSAGE SWITCHES IN THE LONG MESSAGE POSITION

(11) CHECK THE POLAR-NEUTRAL SWITCHES FOR PROPER SETTINGS

(13) CHECK THE LINE CURRENT (SEE PAR. 3b(4) SECT. 3)

(8) PLACE THE NUMBER-DELETE SWITCHES IN THE NUMBER POSITION

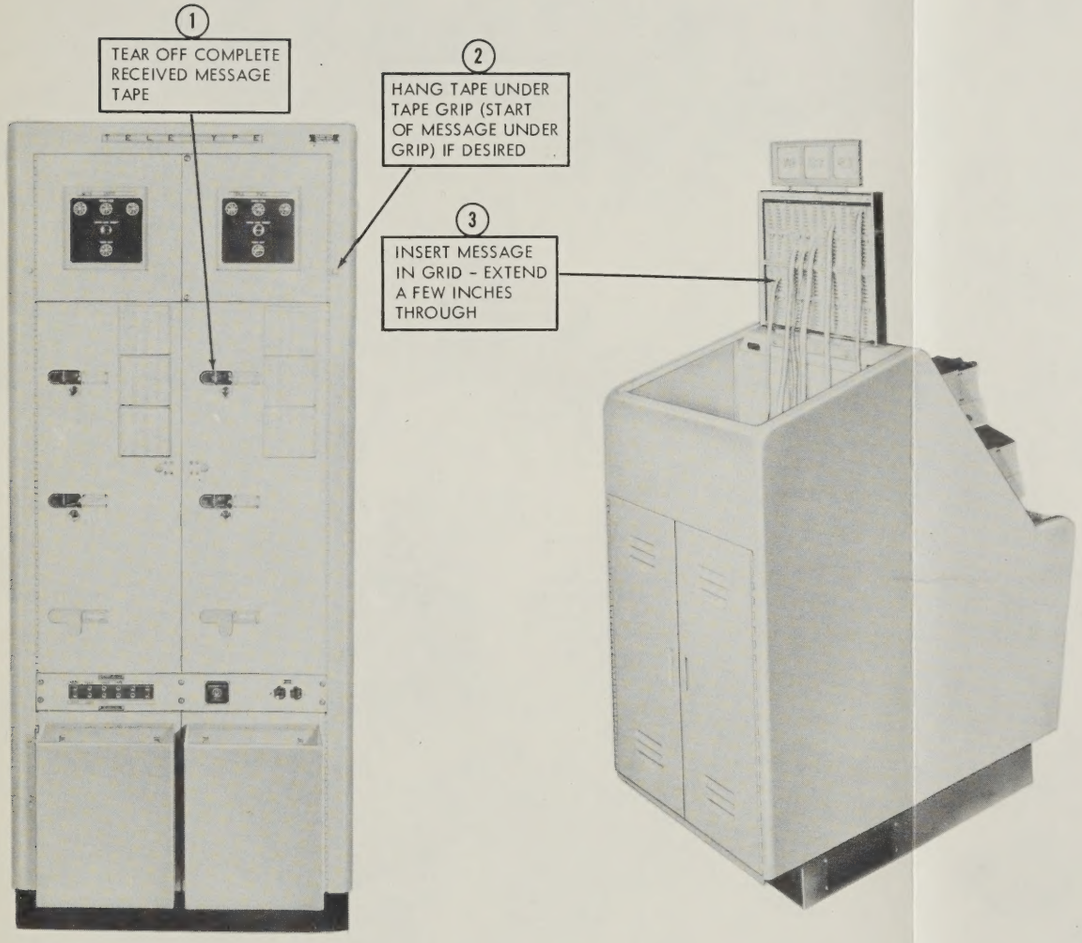


(10) PLACE THE TRANSMITTER LOCKED-NORMAL SWITCH (ON FRONT OF MONITOR GROUP) IN NORMAL POSITION

(14) CHECK THE TIME STAMP SETTINGS (SEE PAR. 3c(4) SECT. 3)

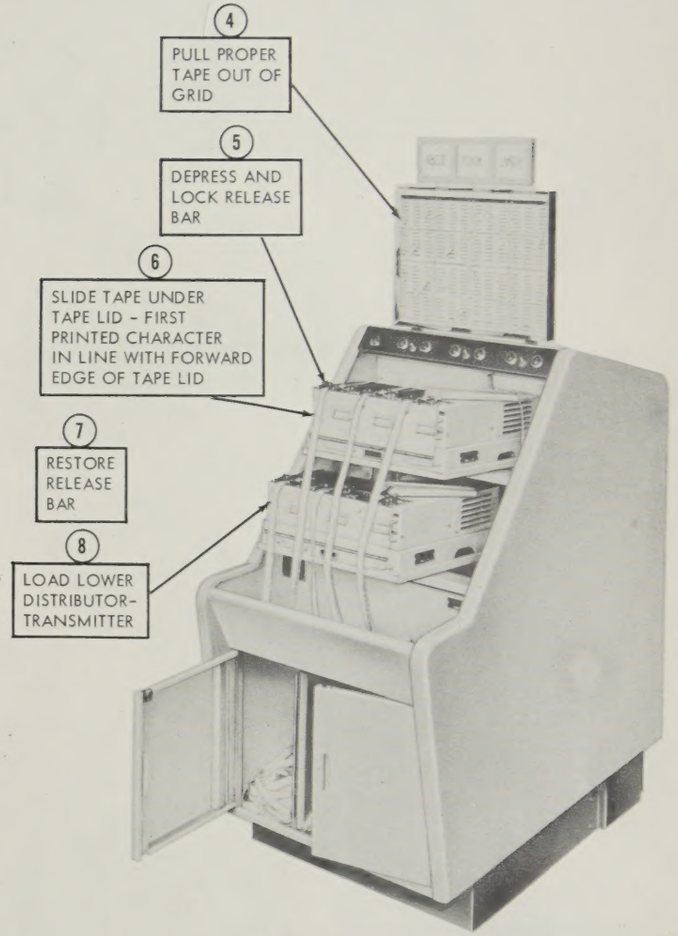
MONITOR GROUP (REAR VIEW)

Figure 4–9. Teletypewriter Set, Starting Procedure


1
TEAR OFF COMPLETE RECEIVED MESSAGE TAPE
2
HANG TAPE UNDER TAPE GRIP (START OF MESSAGE UNDER GRIP) IF DESIRED
3
INSERT MESSAGE IN GRID - EXTEND A FEW INCHES THROUGH

RECEIVER GROUP (FRONT VIEW)

TRANSMITTER GROUP (REAR VIEW)



TRANSMITTER GROUP (FRONT VIEW)

Figure 4–10. Teletypewriter Set, Operating Procedure

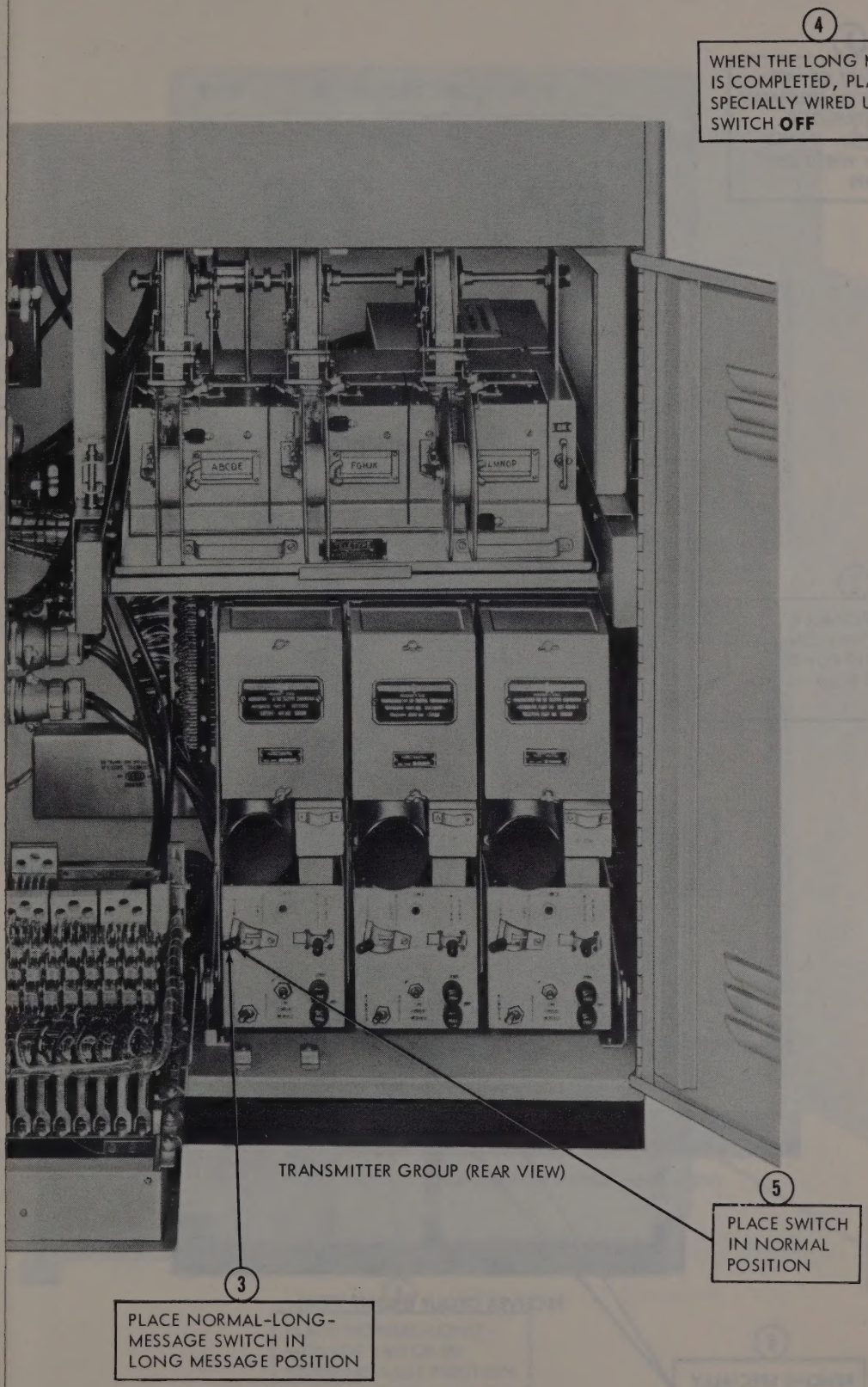
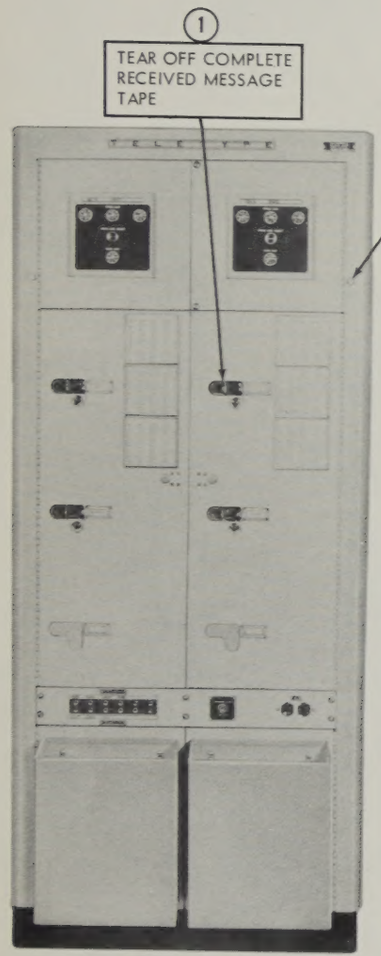
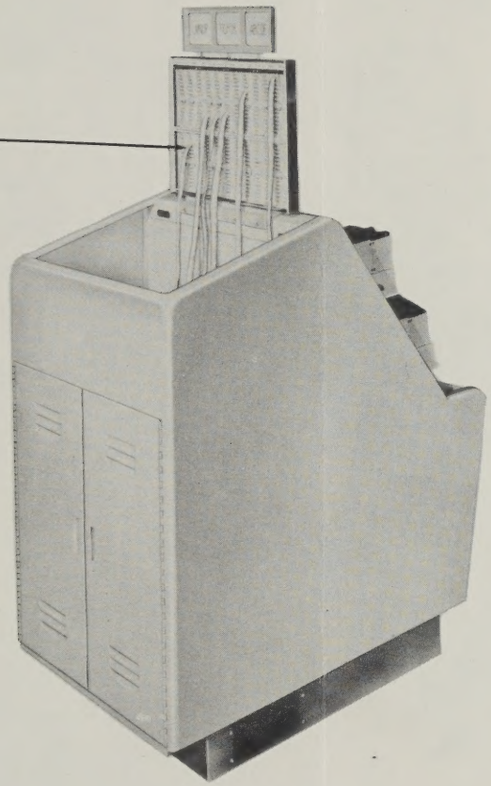


Figure 4—11. Teletypewriter Set, Long Message Operations

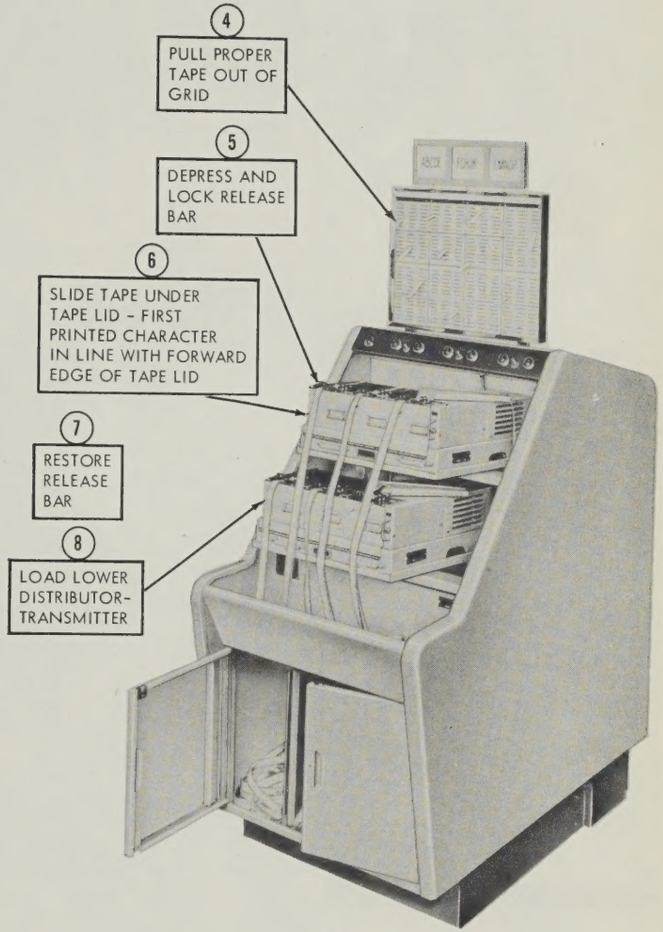
NAVSHIPS 92378
AN/FGC-38, AN/FGC-38X, AN/FGC-39


1
TEAR OFF COMPLETE RECEIVED MESSAGE TAPE
2
HANG TAPE UNDER TAPE GRIP (START OF MESSAGE UNDER GRIP) IF DESIRED
3
INSERT MESSAGE IN GRID - EXTEND A FEW INCHES THROUGH

RECEIVER GROUP (FRONT VIEW)



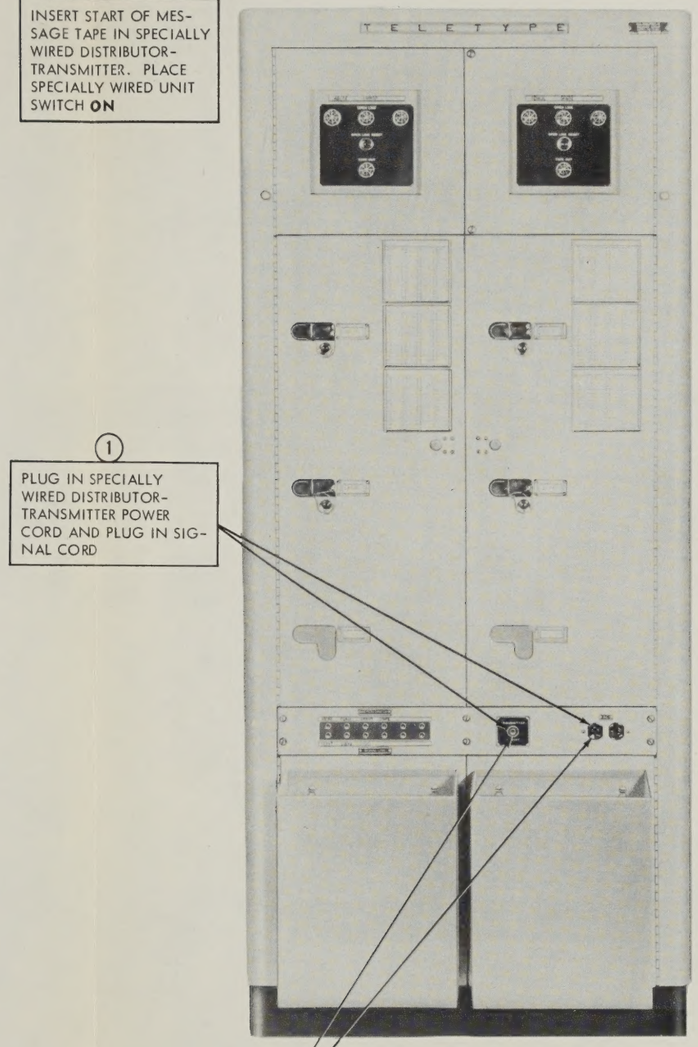
TRANSMITTER GROUP (REAR VIEW)



TRANSMITTER GROUP (FRONT VIEW)

Figure 4–10. Teletypewriter Set, Operating Procedure

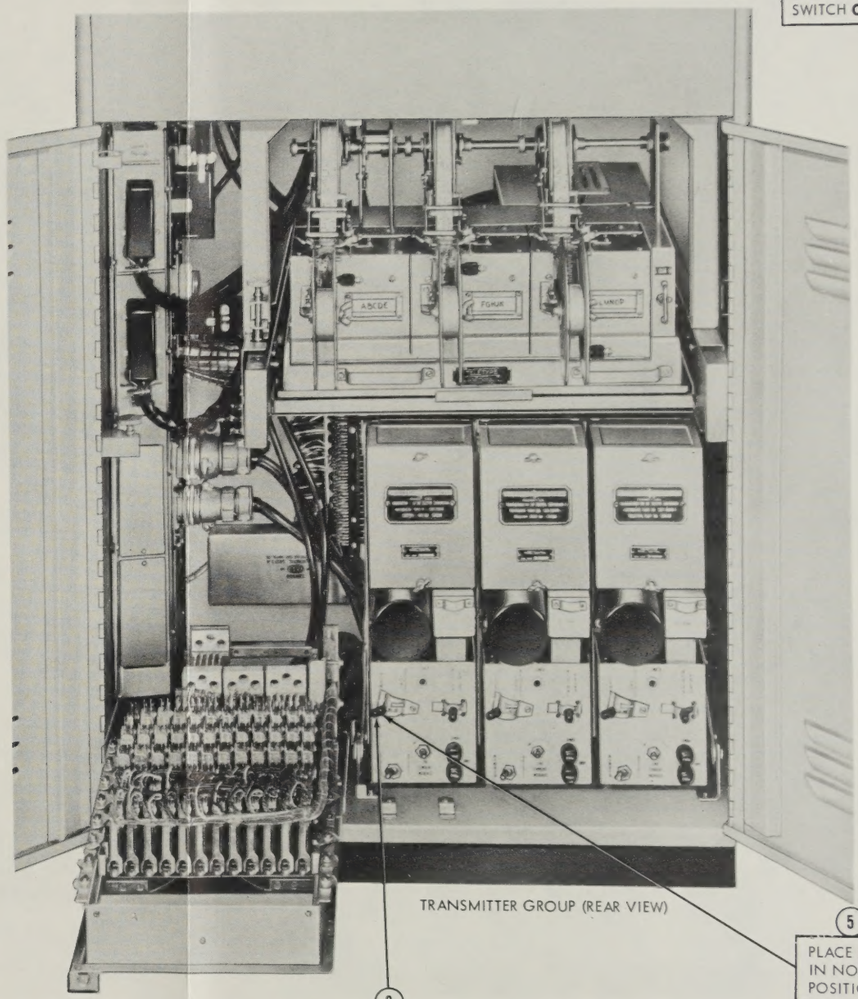
NAVSHIPS 92378
AN/FGC-38, AN/FGC-38X, AN/FGC-39



(1) PLUG IN SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER POWER CORD AND PLUG IN SIGNAL CORD

(2) INSERT START OF MESSAGE TAPE IN SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER. PLACE SPECIALLY WIRED UNIT SWITCH **ON**

(6) REMOVE SPECIALLY WIRED UNIT PLUGS



(3) PLACE NORMAL-LONG-MESSAGE SWITCH IN LONG MESSAGE POSITION

(4) WHEN THE LONG MESSAGE IS COMPLETED, PLACE THE SPECIALLY WIRED UNIT SWITCH **OFF**

(5) PLACE SWITCH IN NORMAL POSITION

Figure 4—11. Teletypewriter Set, Long Message Operations

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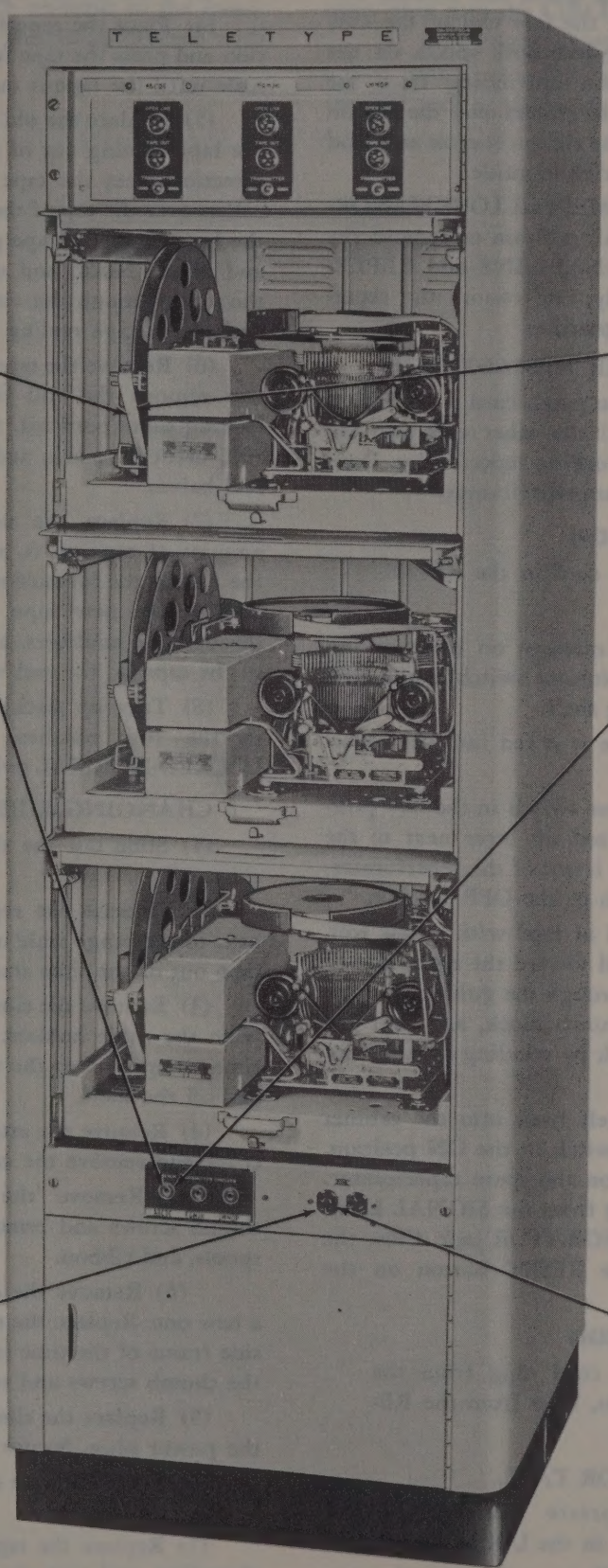


(2)

PILOT TAPE USED
(a) INSERT PILOT TAPE INTO SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER
(b) PLACE SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER SWITCH **ON**
(c) LOCATE MESSAGE ON MONITOR TAPE
(d) INSERT SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER SIGNAL CORD
(e) WHEN PILOT TAPE HAS BEEN TRANSMITTED, PLACE SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER SWITCH **OFF** INSERT RERUN MESSAGE IN SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER. TURN ON SPECIALLY WIRED UNIT

(3)

NO PILOT TAPE USED
(a) LOCATE MESSAGE ON MONITOR TAPE
(b) INSERT MESSAGE IN SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER, PLACE SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER POWER SWITCH **ON**
(c) INSERT SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER SIGNAL PLUG

(1)

PLUG IN SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER POWER PLUG

(4)

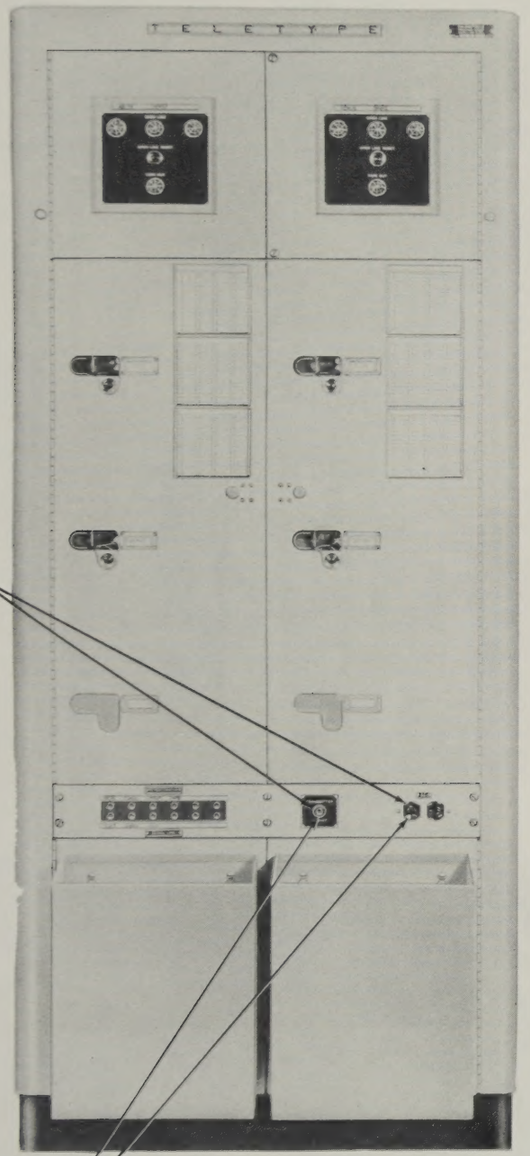
AT END OF MESSAGE PLACE SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER SWITCH **OFF**, PULL SIGNAL PLUG OUT, AND PULL POWER PLUG OUT

Figure 4–12. Teletypewriter Set, Rerunning Message Operations

NAVSHIPS 92378
AN/FGC-38, AN/FGC-38X, AN/FGC-39

(2) INSERT START OF MESSAGE TAPE IN SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER. PLACE SPECIALLY WIRED UNIT SWITCH **ON**

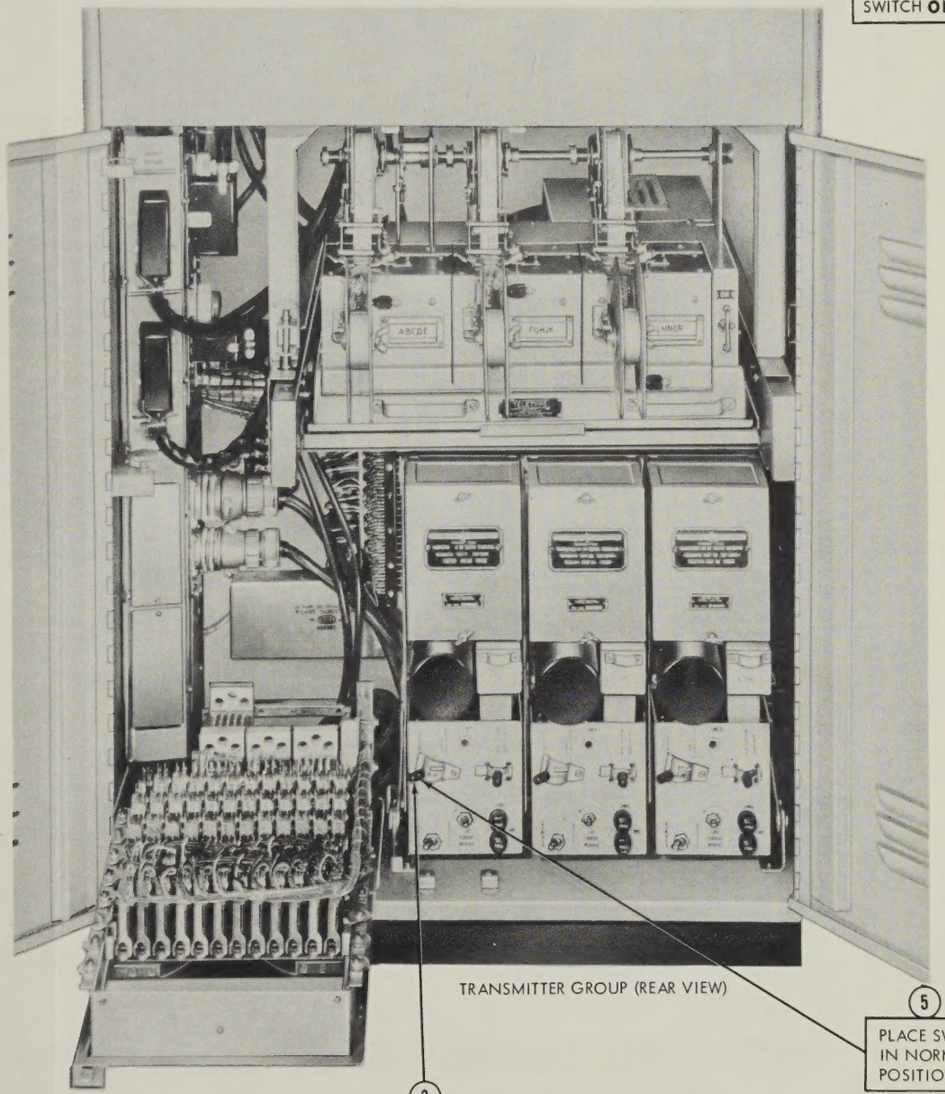
(1) PLUG IN SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER POWER CORD AND PLUG IN SIGNAL CORD



RECEIVER GROUP (FRONT VIEW)

(6) REMOVE SPECIALLY WIRED UNIT PLUGS

(4) WHEN THE LONG MESSAGE IS COMPLETED, PLACE THE SPECIALLY WIRED UNIT SWITCH **OFF**

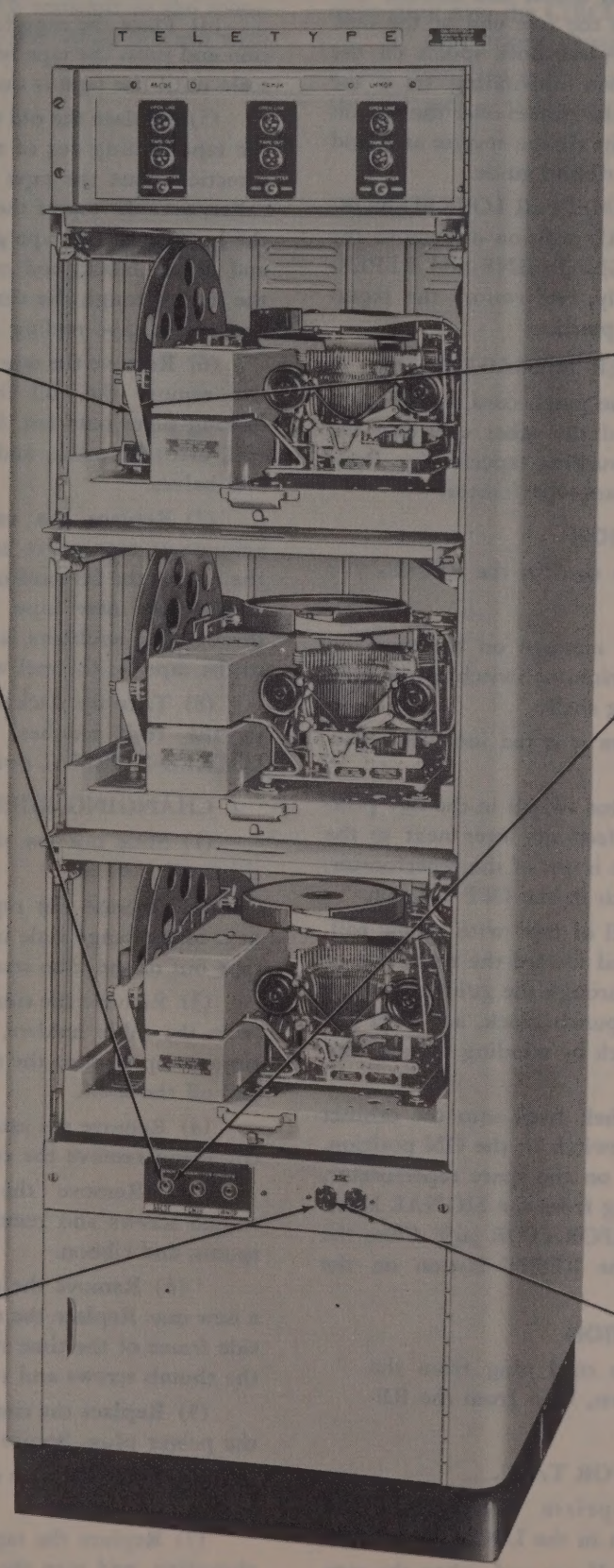


TRANSMITTER GROUP (REAR VIEW)

(5) PLACE SWITCH IN NORMAL POSITION

(3) PLACE NORMAL-LONG-MESSAGE SWITCH IN LONG MESSAGE POSITION

Figure 4—11. Teletypewriter Set, Long Message Operations



(2)

PILOT TAPE USED
(a) INSERT PILOT TAPE INTO SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER
(b) PLACE SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER SWITCH **ON**
(c) LOCATE MESSAGE ON MONITOR TAPE
(d) INSERT SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER SIGNAL CORD
(e) WHEN PILOT TAPE HAS BEEN TRANSMITTED, PLACE SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER SWITCH **OFF** INSERT RERUN MESSAGE IN SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER. TURN ON SPECIALLY WIRED UNIT

(3)

NO PILOT TAPE USED
(a) LOCATE MESSAGE ON MONITOR TAPE
(b) INSERT MESSAGE IN SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER, PLACE SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER POWER SWITCH **ON**
(c) INSERT SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER SIGNAL PLUG

(1)

PLUG IN SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER POWER PLUG

(4)

AT END OF MESSAGE PLACE SPECIALLY WIRED DISTRIBUTOR-TRANSMITTER SWITCH **OFF**, PULL SIGNAL PLUG OUT, AND PULL POWER PLUG OUT

Figure 4—12. Teletypewriter Set, Rerunning Message Operations

(3) Remove both ribbon spools and ribbon. Unwind the ribbon, and attach the free end of the new ribbon to the old spool. Replace both spools on the ribbon shaft with the ribbon unwinding from the bottom of both spools. Pass the ribbon over the ribbon rollers, through the slots in the ribbon reverse arm, and under the center loop of the ribbon guide.

(4) Restore the TRANSMITTER LOCKED-NORMAL switch to the NORMAL position or remove the patching cord from the SIGNAL LINE and REPERFORATOR jacks respectively, and restore the reperforator switches to the ON position.

j. CHANGING RECEIVER MESSAGE TAPE.

(1) Place one end of the patch cord in the spare REPERFORATOR jack, and the other end into the SIGNAL LINE jack of the working reperforator. Press the RESET button for the spare reperforator.

CAUTION

Always place the patch cord in the REPERFORATOR jack first.

(2) At the end of the message on the working reperforator, place the reperforator switch in the OFF position. Pull out the sliding shelf.

(3) Tear the tape where it is fed into the reperforator from the tape reel.

(4) Place the reperforator switch in the ON position and operate the tape feed-out lever next to the range scale until all the tape is out of the reperforator. Place the reperforator switch in the OFF position.

(5) Replace the old roll of tape with a new roll, which should unwind up and toward the right side of the cabinet. Feed the tape through the guides, through the tape chute, across the punch block, and over the feed wheel. Take up the slack by winding it back onto the new roll.

(6) Push the sliding shelf back into the cabinet and place the reperforator switch in the ON position. At the end of the message on the spare reperforator, pull out the patch cord plug from the SIGNAL LINE jack, then from the REPERFORATOR jack. Close the cabinet door and press the RESET button on the working reperforator.

CAUTION

Always pull the patch cord plug from the SIGNAL LINE jack first, then from the REPERFORATOR jack.

k. CHANGING MONITOR TAPE.

(1) Place the appropriate TRANSMITTER LOCKED-NORMAL switch in the LOCKED position.

(2) Pull the sliding shelf out and, when the message is completed, place the reperforator switch in the OFF position.

(3) Tear off the tape near the feeding reel.

(4) Place the reperforator switch in the ON position and press the tape feed-out lever next to the range scale until the tape is out of the reperforator.

(5) Replace the old tape roll with a new one, with the tape coming out of the roll in a counterclockwise direction. Pass the tape on the outside of the spring roller, over the top of the tape guide, then down under the bottom of the tape guide, through the tape chute and punch block, and over the feed wheel. Continue the tape through the time stamp at the white marker and to the tape reeling machine.

(6) Remove the tape reel from the reeling machine and remove the roll from the reel by pulling the locking plate outward. Secure the free end of the old roll, identify, mark, and store the old roll. Clean the reel halves.

(7) Replace the used tape roll, with a small amount of tape on it, into the reel halves, and place the reel in the forward notches of the reeling machine. Thread the new tape through the tight tape arm, through the snubbers, and fasten the end of the tape to the tape on the reel with adhesive tape.

(8) Take up slack in the tape and place the reel in the rear notches. Place the TRANSMITTER LOCKED-NORMAL switch in the NORMAL position.

l. CHANGING RIBBON IN THE TIME STAMP.

(1) Slide out the shelf and turn the reeling machine off.

(2) Operate the reperforator tape feed-out lever next to the range scale until the tape is slack. Slide the tape out of the time stamp.

(3) Remove the time stamp plug and free the cord from the cable holders. Pick up the front end of the time stamp to clear the stud and slide the unit forward and off the shelf.

(4) Remove the attaching screw in the top of the cover and remove the cover.

(*a*) Remove the two ribbon spool bracket thumb screws and remove the ribbon spool brackets, spools, and ribbon.

(*b*) Remove the old ribbon and replace it with a new one. Replace the ribbon spools in the slots in the side frame of the time stamp. Secure the brackets with the thumb screws and replace the cover.

(5) Replace the time stamp on the shelf and insert the power plug. Secure the cable.

(6) Reset the time stamp (see Section 3 paragraph 3*c*(4).

(7) Replace the tape in the time stamp, check the threading, and turn the reeling machine on. Supervise for a few minutes to check for normal operation, then slide the shelf in and close the disappearing door.

m. TRANSMITTING TO THE MONITOR GROUP ON OPEN LINE.—To transmit to the monitor group during an open line condition, proceed with the following steps.

(1) BATTERY SUPPLIED LOCALLY.—Insert an open plug into the CIRCUIT jack at the patch frame.

(2) BATTERY SUPPLIED REMOTELY.—Insert a jack, connected to line battery (observe polarity), into the SET jack at the patch frame.

SECTION 5
OPERATOR'S MAINTENANCE

1. ROUTINE CHECK CHARTS.

The following tables indicate the continuous checks of each group.

TABLE 5-1. ROUTINE CHECK CHART OF RECEIVER GROUP CONTINUOUS CHECK

WHAT TO CHECK	HOW TO CHECK	REMARKS
Tape supply	Tape out alarm lamp. Tape color.	If lighted, replenish. (See Section 4.) If red, replenish. (See Section 4.)
Message tape	Inspect perforations. Inspect typing. Inspect text.	If faulty, notify authorized personnel. If light, replace ribbon. (See Section 4.) If blurred, clean type pallets. If garbled, notify authorized personnel.
OPEN LINE alarm	Observe lamp.	If lit, press reset button. Check tape for lost characters. If lamp is not extinguished, notify authorized personnel.

TABLE 5-2. ROUTINE CHECK CHART OF TRANSMITTER GROUP CONTINUOUS CHECK

WHAT TO CHECK	HOW TO CHECK	REMARKS
Tape feeding	Observe tape being fed through distributor-transmitter.	If tape is not being fed correctly, depress release bar and reposition tape. If feeding is still faulty, notify authorized maintenance personnel.
OPEN LINE alarm	Observe lamp.	If lit, press reset button, depress release bar, back up tape and rerun message from beginning. If lamp is not extinguished, notify authorized maintenance personnel.
Expended tape bins	See if it is filled with tape.	When full, empty as per office procedure.
Tandem operation	See that the other transmitter starts when the message in one is completed.	If faulty, notify authorized maintenance personnel.
Message numbering	See that there is a noticeable delay before a message tape starts feeding.	If no delay, notify authorized maintenance personnel.

TABLE 5-3. ROUTINE CHECK CHART OF MONITOR GROUP CONTINUOUS CHECK

WHAT TO CHECK	HOW TO CHECK	REMARKS
Tape supply	Tape out alarm lamp. Tape color.	If lit, replenish tape. (See Section 4.) If red, replenish tape. (See Section 4.)
Monitor tape	Inspect perforations. Inspect typing. Inspect text.	If faulty, notify authorized maintenance personnel. If light, replace ribbon. (See Section 4.) If blurred, clean type pallets. If garbled, notify authorized maintenance personnel.
OPEN LINE alarm	Observe lamp.	Refer to transmitter open line alarm.
Time Registration	Observe tape coming out of time stamp.	If not stamping correctly, notify authorized maintenance personnel.
Tape reeling	Observe reeling of tape on tape reeling machine.	If faulty, notify authorized maintenance personnel.

2. EMERGENCY MAINTENANCE.

Notice to Operators

Operators shall not perform any of the following emergency maintenance procedures without proper authorization.

a. PROBABLE FUSE FAILURE.—Symptoms of probable fuse failure are given in tables 5-4, 5-5, 5-6, 5-7, 5-8, and 5-9.

WARNING

Never replace a fuse with one of higher rating unless continued operation of the equipment is more important than probable damage. If a fuse burns out immediately after replacement, do not replace it a second time until the cause has been corrected.

TABLE 5-4. SYMPTOMS OF FUSE FAILURE IN RECEIVER GROUP

INDICATION	BLOWN FUSE		COMMENTS
	AN/FGC-38, 39	AN/FGC-38X	
Upper left reperforator does not operate	F-1901	F-1909	Replace fuse.
Upper right reperforator does not operate	F-1902	F-1910	Replace fuse.
Middle left reperforator does not operate	F-1903	F-1911	Replace fuse.
Middle right reperforator does not operate	F-1904	F-1912	Replace fuse. (This reperforator is the spare.)
Lower left reperforator does not operate	F-1905	F-1913	Replace fuse. (This reperforator is not supplied with equipment.)
Lower right reperforator does not operate	F-1906	F-1914	Replace fuse. (This reperforator is not supplied with equipment.)
Auxiliary distributor-transmitter does not operate	F-1907	F-1915	Replace fuse.
No lamps operate	F-1908	F-1916	Replace fuse.

TABLE 5-5. SYMPTOMS OF FUSE FAILURE IN TRANSMITTER GROUP

INDICATION	BLOWN FUSE		COMMENTS
	AN/FGC-38, 39	AN/FGC-38X	
Upper message distributor-transmitters do not operate. Busy lamp and open line alarm lamp associated with line 1 on transmitting and monitoring cabinets do not light.	F-2001	F-2004	Replace fuse.
Lower message distributor-transmitters do not operate. Busy lamp and open line alarm lamp associated with line 2 on transmitting and monitoring cabinets do not light.	F-2002	F-2005	Replace fuse.
Number distributor-transmitters do not operate. Busy lamp and open line alarm lamp associated with line 3 on transmitting and monitoring cabinets do not light.	F-2003	F-2006	Replace fuse.

TABLE 5-6. SYMPTOMS OF FUSE FAILURE IN MONITOR GROUP

INDICATION	BLOWN FUSE		COMMENTS
	AN/FGC-38, 39	AN/FGC-38X	
Upper reperforator and reeling machine do not operate. Tape out alarm lamp does not light.	F-301	F-310	Replace fuse.
Middle reperforator and reeling machine do not operate. Tape out alarm lamp does not light.	F-302	F-311	Replace fuse.
Lower reperforator and reeling machine do not operate. Tape out alarm lamp does not light.	F-303	F-312	Replace fuse.
Upper time stamp does not operate.	F-305		Replace fuse.
Middle time stamp does not operate.	F-306		Replace fuse.
Lower time stamp does not operate.	F-307		Replace fuse.
Auxiliary and convenience receptacles do not supply power.	F-304	F-313	Replace fuse.

TABLE 5-7. SYMPTOMS OF FUSE FAILURE IN POWER SUPPLY

INDICATION	BLOWN FUSE	COMMENTS
D-c pilot lamp does not light	F-501 and/or F-502	Each fuse is connected to one side of the line. If either fuse blows, the power supply is not energized. Replace blown fuse.
TRANSMITTER GROUP. Open line alarm lamp lit. Transmission stops. Busy lights remain lit. Monitor reperforators run open.	F-503	Replace fuse.
RECEIVER GROUP. Receiving reperforators run open.	F-503	Replace fuse.
TRANSMITTER GROUP. All transmission stops. All busy lights out. All open line alarm, lamps lit. Monitor reperforators in idle line condition.	F-504	Replace fuse.
RECEIVER GROUP. All open line alarm lamps lit. No tape feed-out at end of message. Spare reperforator does not start when patched in. Receiving reperforators receive normally.	F-504	Replace fuse.
On polar operation only. Simulated idle line condition on receiving reperforator at distant station. (No spacing signals sent by transmitting line relay. Transmitter Group only.)	F-505	Replace fuse.

TABLE 5-8. SYMPTOMS OF FUSE FAILURE IN CONTROL PANEL SB-358/FGC

INDICATION	BLOWN FUSE	COMMENTS
OPEN LINE alarm lamp does not stay reset, but reperforator receives message. Reperforator does not feed out tape at end of message. SPARE reperforator motor does not start when it is patched into an operating circuit.	F-109	Replace fuse.

TABLE 5-9. SYMPTOMS OF FUSE FAILURE OF CONTROL PANEL 357/FGC

INDICATION	BLOWN FUSE	COMMENTS
CHANNEL BUSY lamp does not light. Tandem transmitters do not transmit. Numbering distributor-transmitter does not operate. OPEN LINE alarm lamp does not stay reset.	F-204	Replace fuse.

b. FUSE LOCATIONS.—Tables 5-10, 5-11, 5-12, 5-13, 5-14, and 5-15 give the fuse locations of the equipment. Refer also to figures 5-1, 5-2, 5-3, 5-4, 5-5, and 5-6.

TABLES 5-10. FUSE LOCATIONS IN RECEIVER GROUP

All are fusetrons except F-1908 and F-1916 which are fuses.

SYMBOL	LOCATION	PROTECTS	AMPS		VOLTS	PART NUMBER
			AN/FGC-38, 39	AN/FGC-38X		
F-1901	Left side wireway	Upper left reperforator	3.2		115	103284
F-1909				1.6		103286
F-1902	Right side wireway	Upper right reperforator	3.2		115	103284
F-1910				1.6		103286
F-1903	Left side wireway	Middle left reperforator	3.2		115	103284
F-1911				1.6		103286
F-1904	Right side wireway	Middle right reperforator	3.2		115	103284
F-1912				1.6		103286
F-1905	Left side wireway	Lower left reperforator	3.2		115	103284
F-1913				1.6		103286
F-1906	Right side wireway	Lower right reperforator	3.2		115	103284
F-1914				1.6		103286
F-1907 F-1915	Left side wireway	Convenience receptacle on front panel	3.2	3.2	115	103284
F-1908 F-1916	Left side wireway	Open line alarm lamps	1	1	115	80905

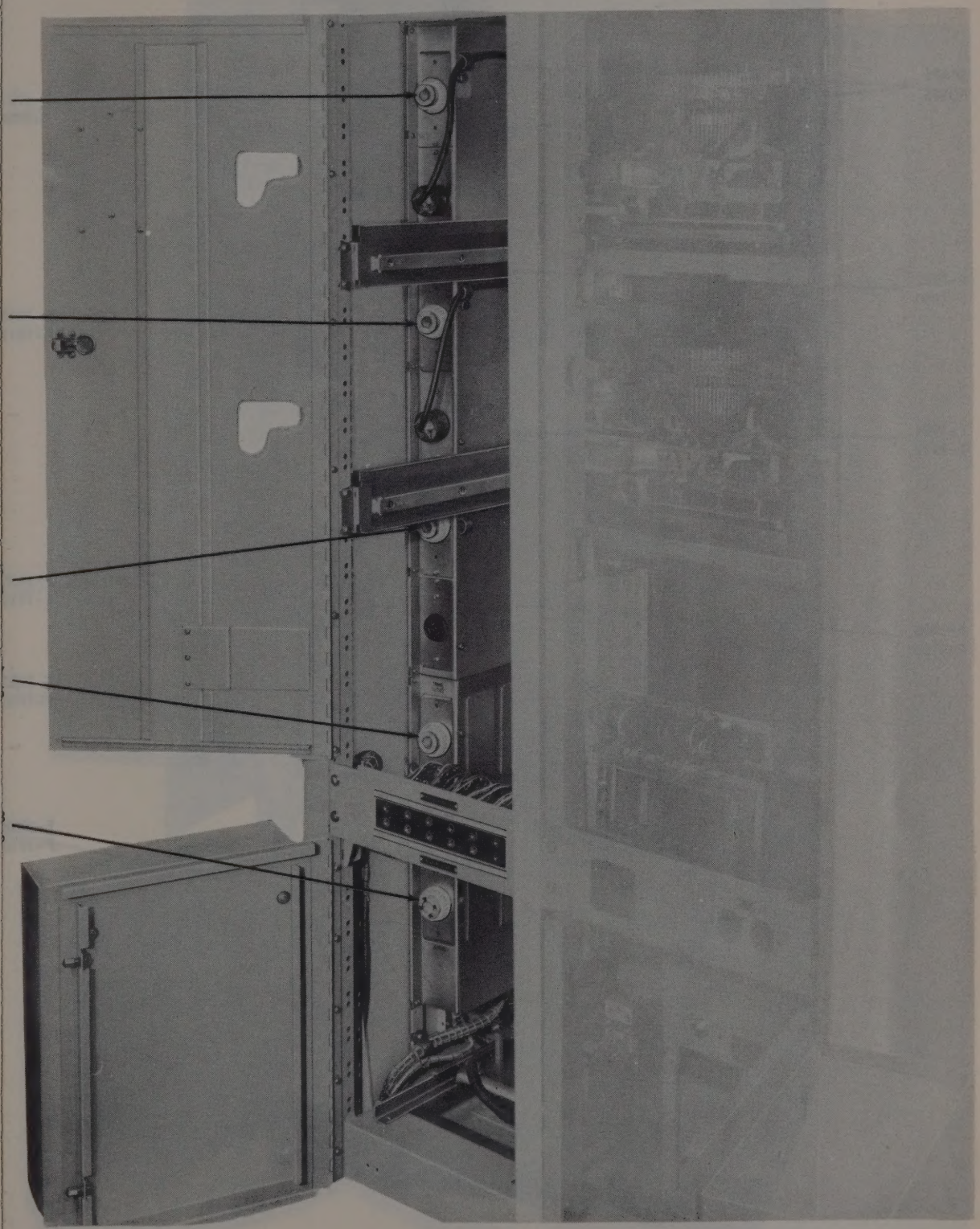


Figure 5—1. Receiver Group Fuse Locations

TABLE 5-7. SYMPTOMS OF FUSE FAILURE IN POWER SUPPLY

INDICATION	BLOWN FUSE	COMMENTS
D-c pilot lamp does not light	F-501 and/or F-502	Each fuse is connected to one side of the line. If either fuse blows, the power supply is not energized. Replace blown fuse.
TRANSMITTER GROUP. Open line alarm lamp lit. Transmission stops. Busy lights remain lit. Monitor reperforators run open.	F-503	Replace fuse.
RECEIVER GROUP. Receiving reperforators run open.	F-503	Replace fuse.
TRANSMITTER GROUP. All transmission stops. All busy lights out. All open line alarm, lamps lit. Monitor reperforators in idle line condition.	F-504	Replace fuse.
RECEIVER GROUP. All open line alarm lamps lit. No tape feed-out at end of message. Spare reperforator does not start when patched in. Receiving reperforators receive normally.	F-504	Replace fuse.
On polar operation only. Simulated idle line condition on receiving reperforator at distant station. (No spacing signals sent by transmitting line relay. Transmitter Group only.)	F-505	Replace fuse.

TABLE 5-8. SYMPTOMS OF FUSE FAILURE IN CONTROL PANEL SB-358/FGC

INDICATION	BLOWN FUSE	COMMENTS
OPEN LINE alarm lamp does not stay reset, but reperforator receives message. Reperforator does not feed out tape at end of message. SPARE reperforator motor does not start when it is patched into an operating circuit.	F-109	Replace fuse.

TABLE 5-9. SYMPTOMS OF FUSE FAILURE OF CONTROL PANEL 357/FGC

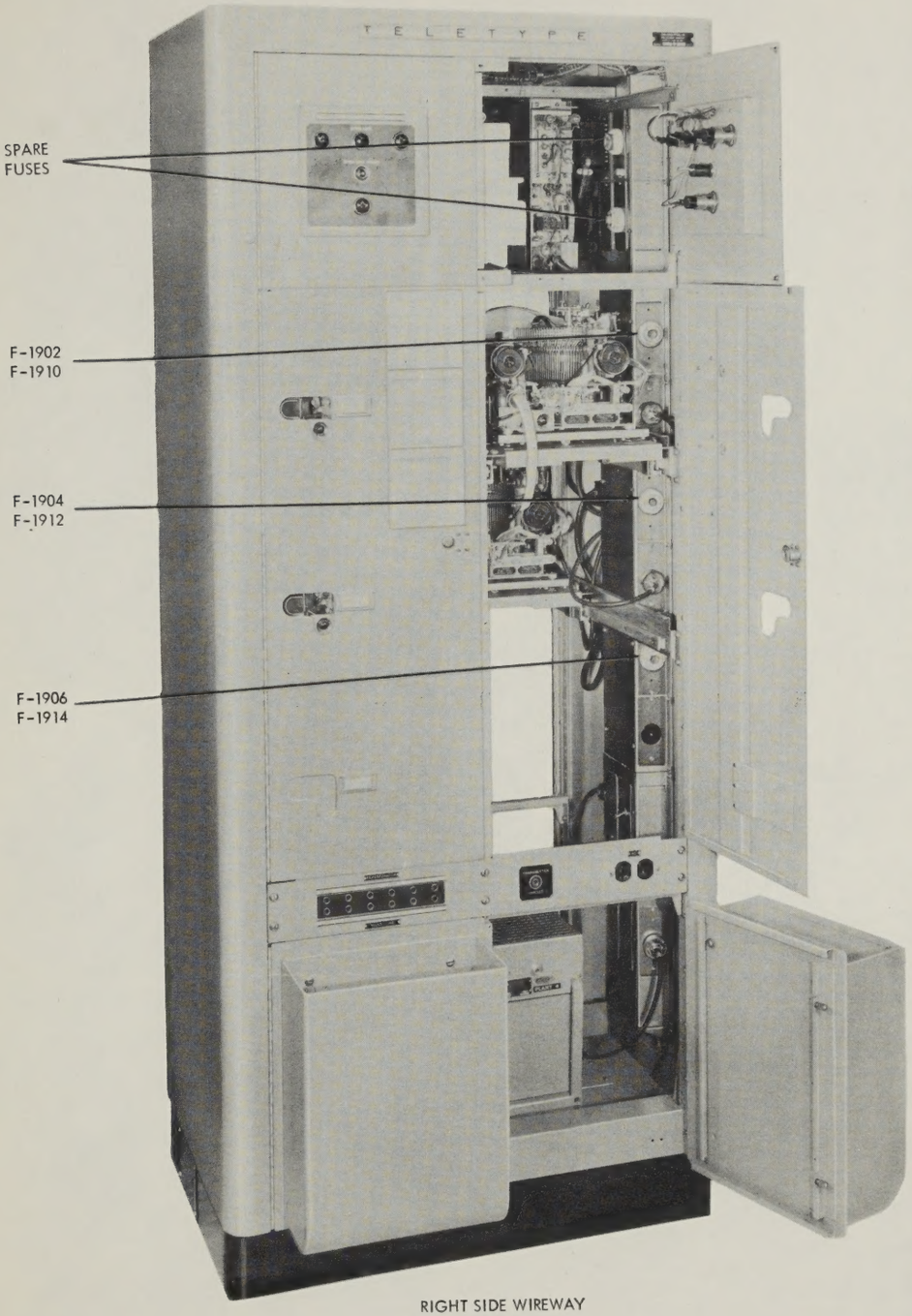
INDICATION	BLOWN FUSE	COMMENTS
CHANNEL BUSY lamp does not light. Tandem transmitters do not transmit. Numbering distributor-transmitter does not operate. OPEN LINE alarm lamp does not stay reset.	F-204	Replace fuse.

b. FUSE LOCATIONS.—Tables 5-10, 5-11, 5-12, 5-13, 5-14, and 5-15 give the fuse locations of the equipment. Refer also to figures 5-1, 5-2, 5-3, 5-4, 5-5, and 5-6.

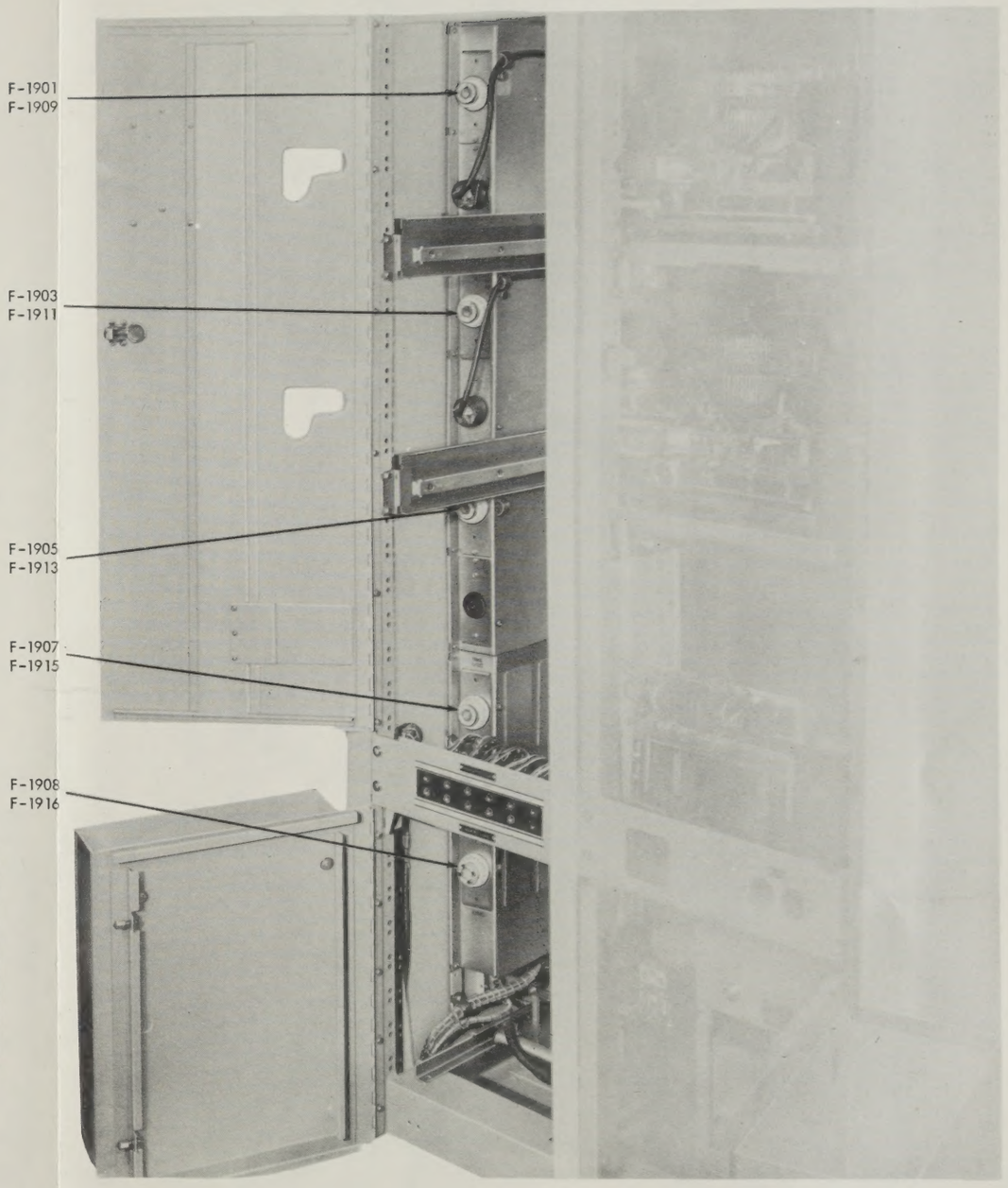
TABLES 5-10. FUSE LOCATIONS IN RECEIVER GROUP

All are fusetrons except F-1908 and F-1916 which are fuses.

SYMBOL	LOCATION	PROTECTS	AMPS		VOLTS	PART NUMBER
			AN/FGC-38, 39	AN/FGC-38X		
F-1901	Left side wireway	Upper left reperforator	3.2		115	103284
F-1909				1.6		103286
F-1902	Right side wireway	Upper right reperforator	3.2		115	103284
F-1910				1.6		103286
F-1903	Left side wireway	Middle left reperforator	3.2		115	103284
F-1911				1.6		103286
F-1904	Right side wireway	Middle right reperforator	3.2		115	103284
F-1912				1.6		103286
F-1905	Left side wireway	Lower left reperforator	3.2		115	103284
F-1913				1.6		103286
F-1906	Right side wireway	Lower right reperforator	3.2		115	103284
F-1914				1.6		103286
F-1907 F-1915	Left side wireway	Convenience receptacle on front panel	3.2	3.2	115	103284
F-1908 F-1916	Left side wireway	Open line alarm lamps	1	1	115	80905



RIGHT SIDE WIREWAY



LEFT SIDE WIREWAY

Figure 5–1. Receiver Group Fuse Locations

TABLES 5-11. FUSE LOCATIONS IN TRANSMITTER GROUP

All fusetrons

SYMBOL	LOCATION	PROTECTS	AMPS		VOLTS	PART NUMBER
			AN/FGC-38, 39	AN/FGC-38X		
F-2001	Wireway	Upper message-base motor	3.2		115	103284
F-2004				1.6		103286
F-2002	Wireway	Lower message-base motor	3.2		115	103284
F-2005				1.6		103286
F-2003	Wireway	Number-base motor	3.2		115	103284
F-2006				1.6		103286

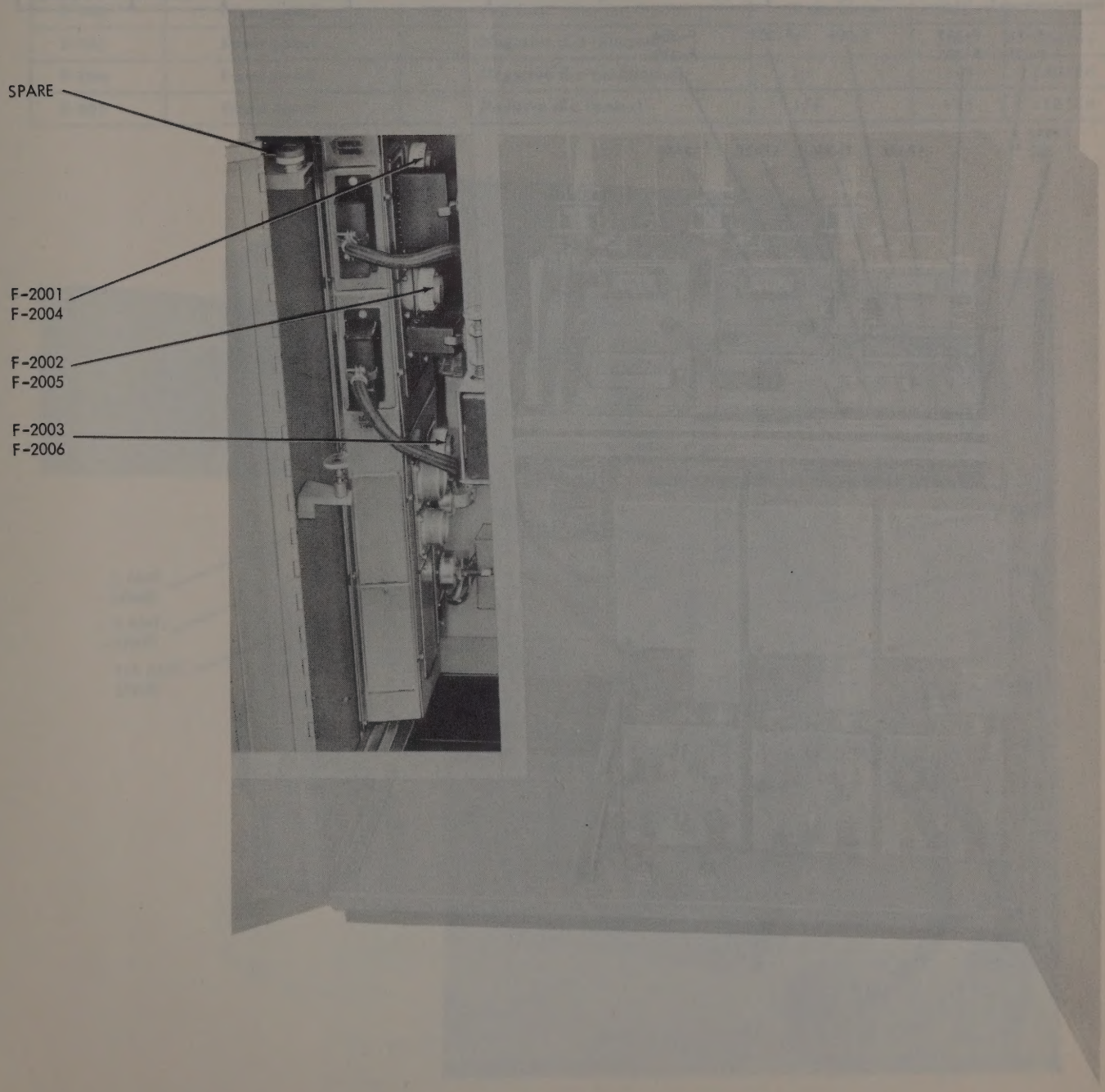
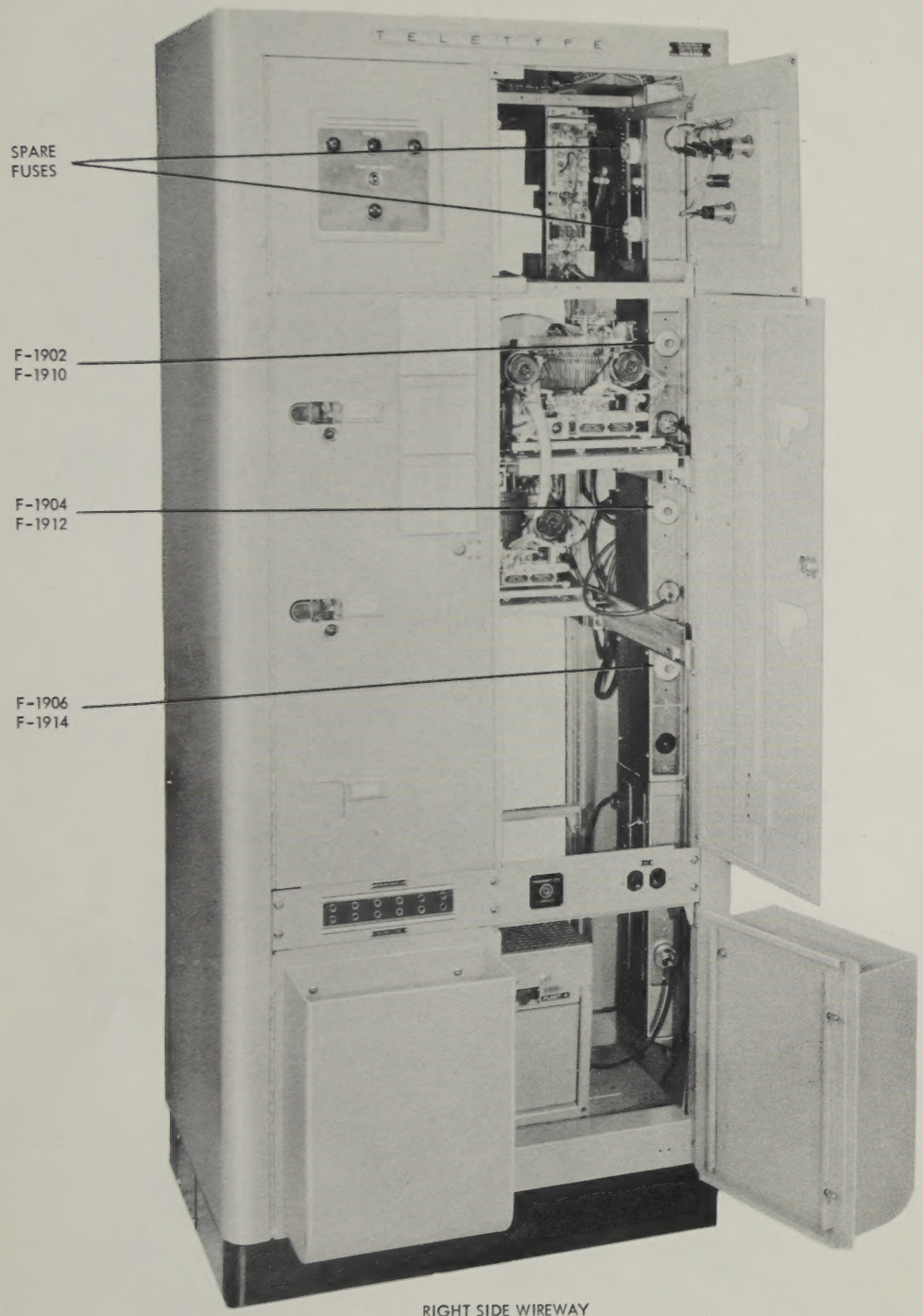
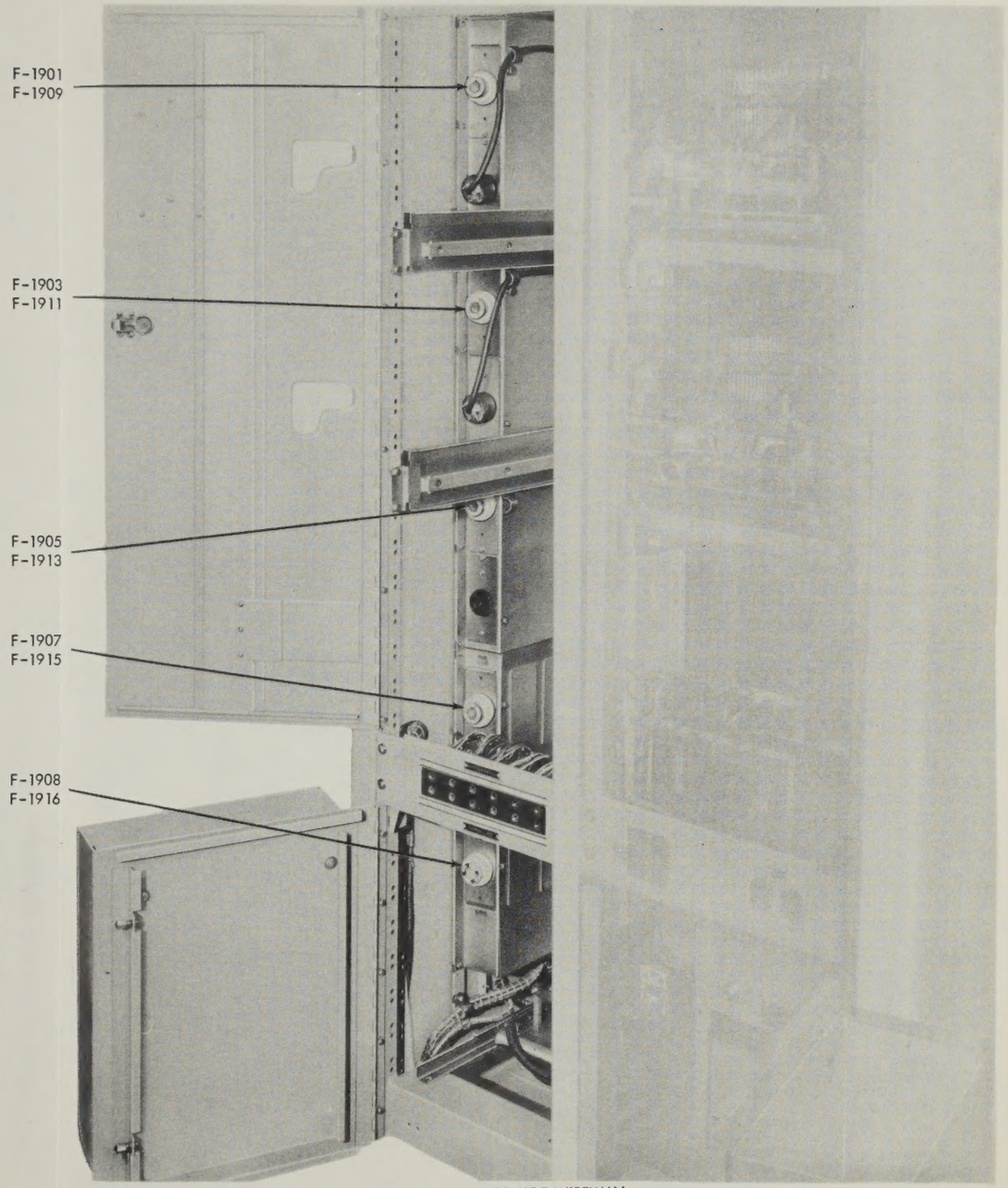


Figure 5—2. Transmitter Group Fuse Locations

NAVSHIPS 92378
AN/FGC-38, AN/FGC-38X, AN/FGC-39



RIGHT SIDE WIREWAY



LEFT SIDE WIREWAY

Figure 5–1. Receiver Group Fuse Locations

TABLES 5-11. FUSE LOCATIONS IN TRANSMITTER GROUP

All fusetrons

SYMBOL	LOCATION	PROTECTS	AMPS		VOLTS	PART NUMBER
			AN/FGC-38, 39	AN/FGC-38X		
F-2001	Wireway	Upper message-base motor	3.2		115	103284
F-2004				1.6		103286
F-2002	Wireway	Lower message-base motor	3.2		115	103284
F-2005				1.6		103286
F-2003	Wireway	Number-base motor	3.2		115	103284
F-2006				1.6		103286

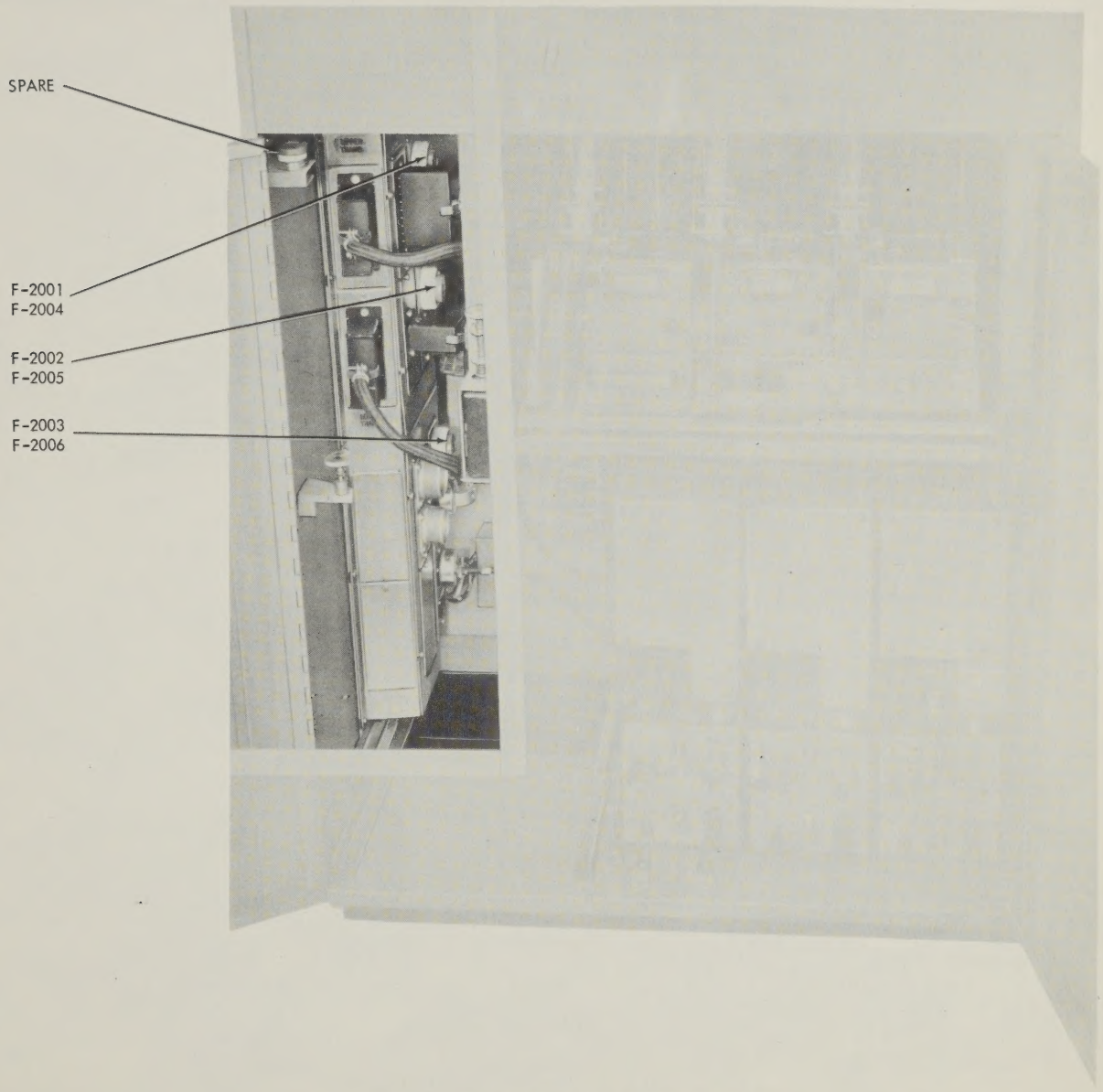


Figure 5–2. Transmitter Group Fuse Locations

TABLE 5-12. FUSE LOCATIONS IN MONITOR GROUP

All fusetrons

SYMBOL	LOCATION	PROTECTS	AMPS		VOLTS	PART NUMBER
			AN/FGC-38, 39	AN/FGC-38X		
F-301	Behind upper panel	Upper reperforator and reeling machine	4.0		115	129431
F-310				2.5		129830
F-302	Behind upper panel	Middle reperforator and reeling machine	4.0		115	129431
F-311				2.5		129830
F-303	Behind upper panel	Lower reperforator and reeling machine	4.0		115	129431
F-312				2.5		129830
F-305	Behind upper panel	Upper time stamp	1.6		115	103286

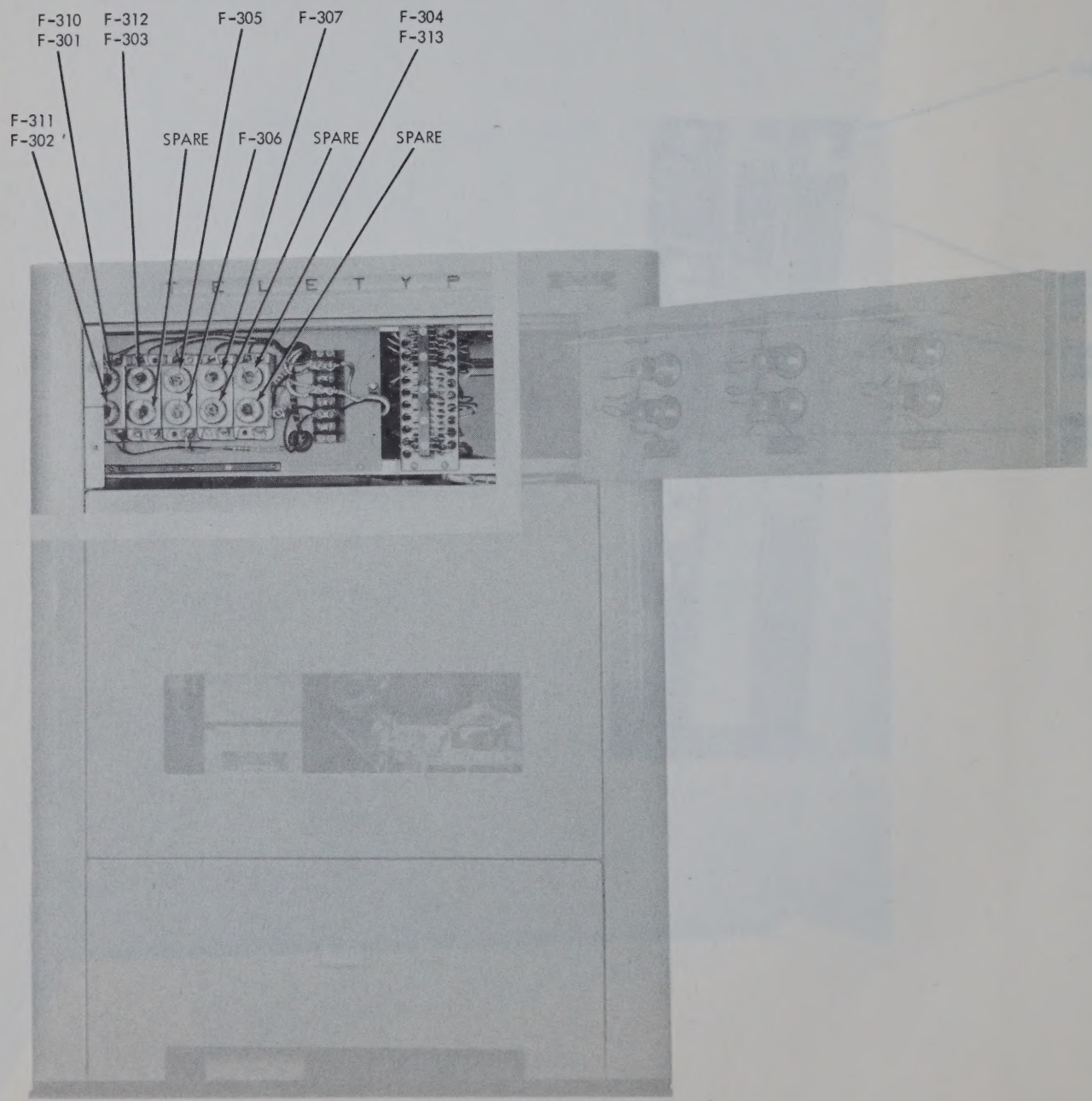


Figure 5—3. Monitor Group Fuse Locations

SYMBOL	LOCATION	PROTECTS	AMPS		VOLTS	PART NUMBER
			AN/FGC-38, 39	AN/FGC-38X		
F-306	Behind upper panel	Middle time stamp	1.6		115	103286
F-307	Behind upper panel	Lower time stamp	1.6		115	103286
F-304	Behind upper panel	Auxiliary and convenience receptacles	3.2		115	103284
F-313				1.6		103286

TABLE 5-13. FUSE LOCATIONS IN POWER SUPPLY

SYMBOL	LOCATION	PROTECTS	AMPS	VOLTS	NUMBERS
F-501	Front panel	A-C line	5 slo-blow	115	130506
F-502	Front panel	A-C line	5 slo-blow	115	130506
F-503	Front panel	Negative d-c (filtered)	2	115	120166
F-504	Front panel	Negative d-c (unfiltered)	2	115	120166
F-505	Front panel	Positive d-c (polar)	1/4	115	118510

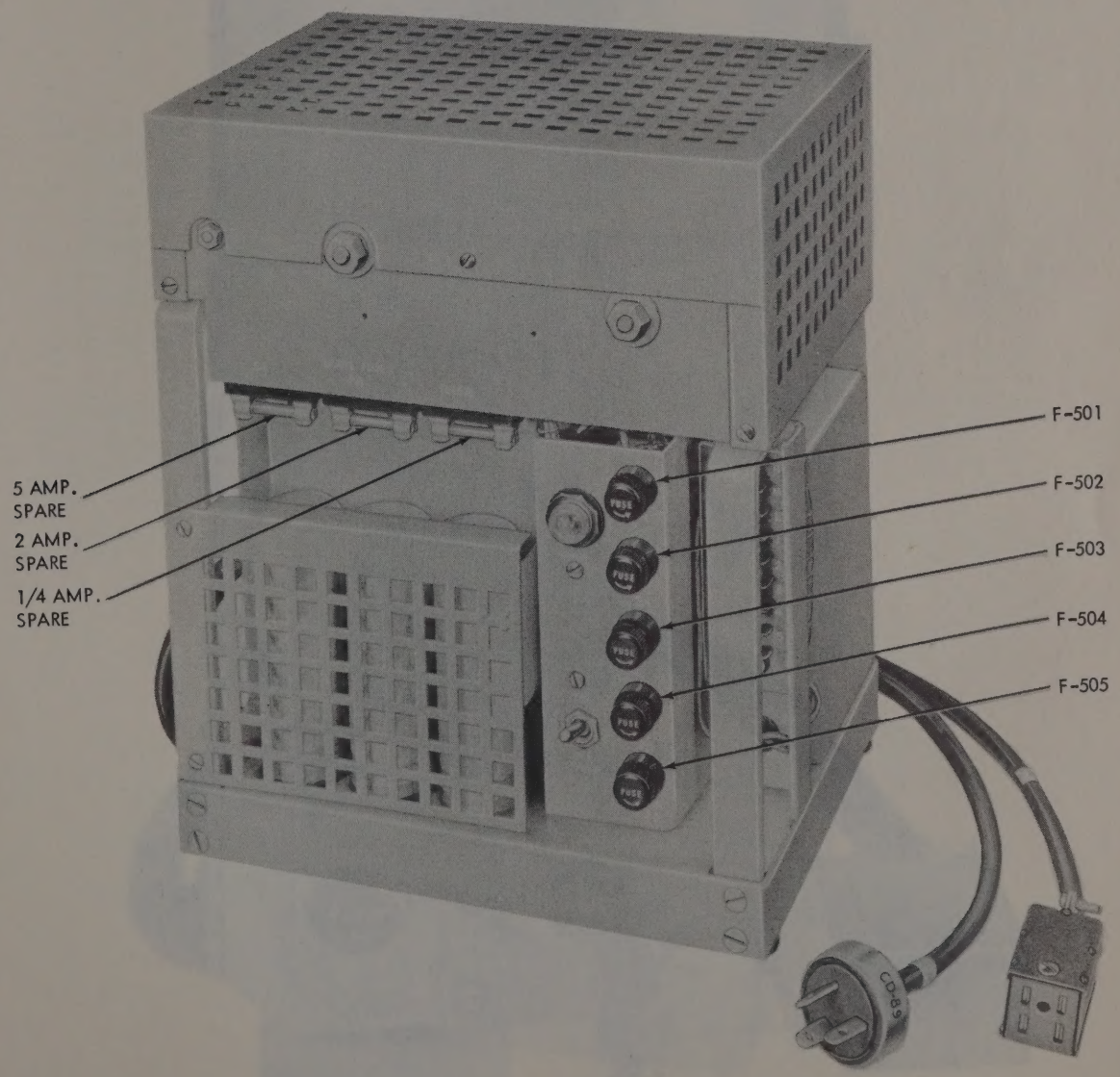


Figure 5—4. Power Supply PP-987/U, Fuse Locations

TABLE 5-14. FUSE LOCATIONS IN CONTROL PANEL SB-358/FGC

SYMBOL	LOCATION	PROTECTS	AMPS	VOLTS	NUMBERS
F-109	On front panel of control panel	K-101, K-102, K-103, and K-104	0.5	115	118511

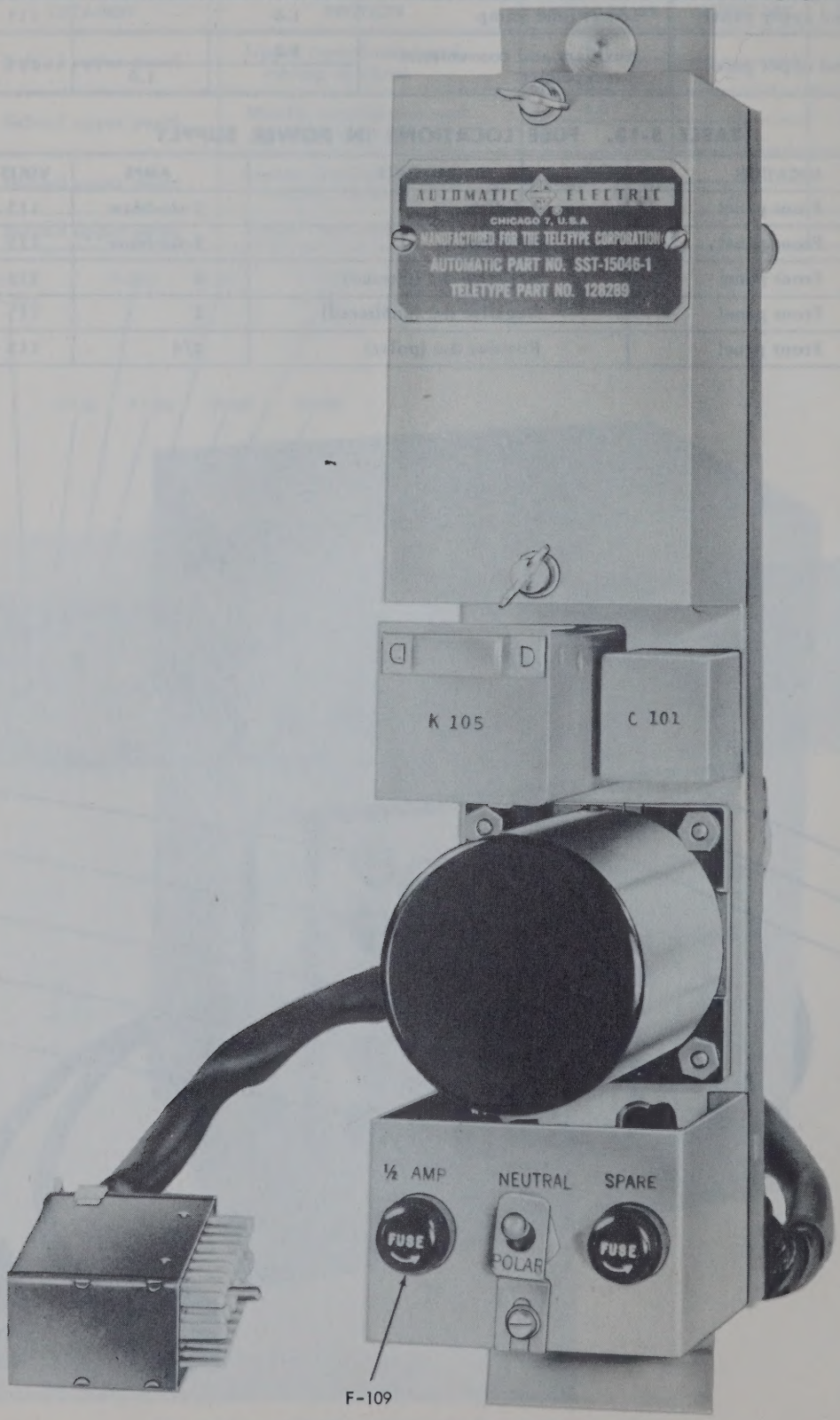


Figure 5—5. Control Panel SB-358/FGC, Fuse Locations.

TABLE 5-15. FUSE LOCATIONS IN CONTROL PANEL SB-357/FGC

SYMBOL	LOCATION	PROTECTS	AMPS	VOLTS	NUMBERS
F-204	On front panel of control panel	K-202 (lower winding), K-203, K-204, K-205, K-207, K-208, and K-210	0.5	115	118511

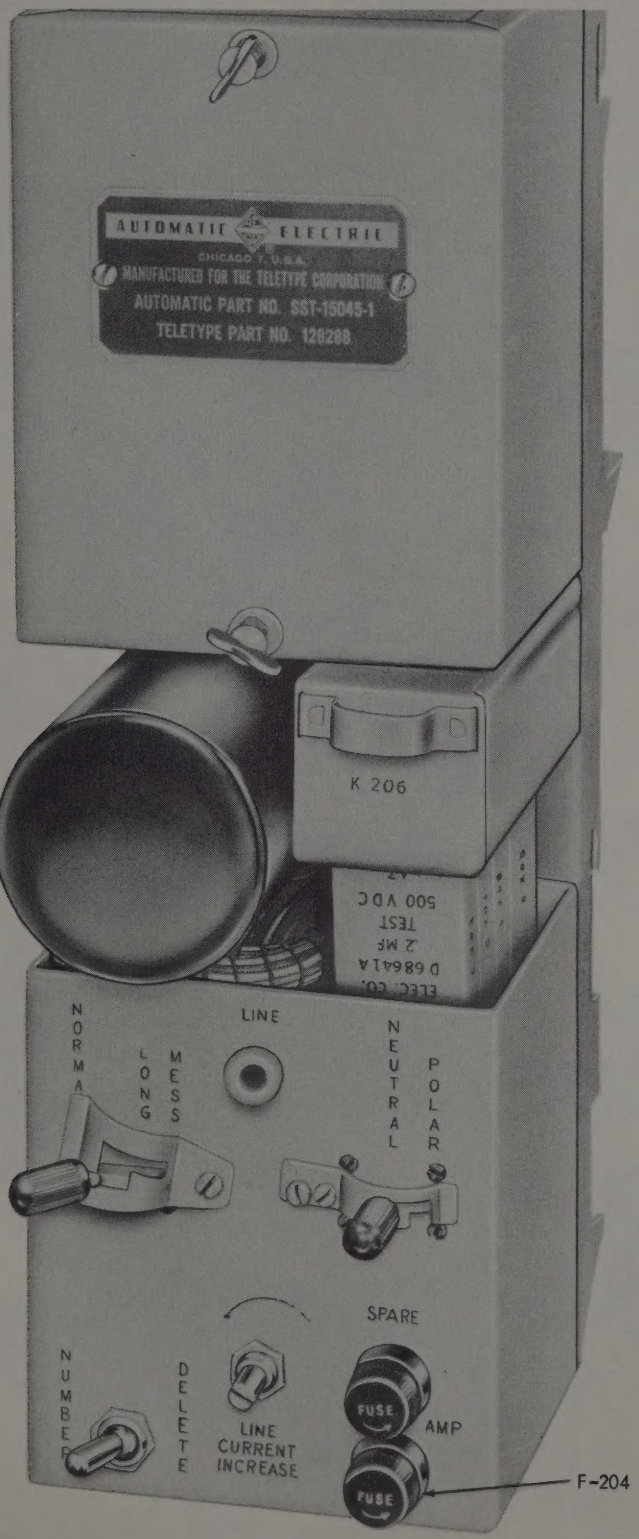


Figure 5—6. Control Panel SB-357/FGC, Fuse Locations